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Volume 20 Sept. 1955 Number 3

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THE JOURNAL OF SPEECH AND HEARING DISORDERS

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THE AMERICAN SPEECH AND HEARING ASSOCIATION

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THIRTY-FIRST ANNUAL CONVENTION

November 17-19, 1955, Hotel Statler, Los Angeles

AMERICAN SPEECH AND HEARING ASSOCIATION

PROGRAM ANNOUNCEMENT

(Some additional sections and papers will be announced later.)

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Tuesday, November 15
(Pre-Convention)
1:30 p. m. and 7:30 p. m.
Meeting of the Executive Council

Wednesday, November 16
(Pre-Convention)
9:00 a. m., 2:00 p. m. and 7:30 p. m.
Meeting of the Executive Council
11:30 a. m.
Called Meetings of Association Committees

Thursday, November 17

CURRENT RESEARCH IN STUTTERING

9:00 to 10:25 a.m.

Chairman: Joseph G. Sheehan, University of California

Effects of reward and punishment on stuttering behavior. Calvin Frederick, Pacific State Hospital, California

Stuttering as an aid to intelligibility. John J. Dreher, Ohio State University

Extensional definition of stuttering. Richard Boehmler, Humboldt State College, California

Experimental comparison of three techniques in speech therapy. Joseph G. Sheehan, University of California, and Robert Voas, Naval School of Aviation Medicine

The effect of a measured audience reaction on stuttering behavior patterns. Halvor P. Hansen, University of Colorado

Discussion

RESEARCH IN SPEECH AND LANGUAGE PHENOMENA

9:00 to 10:25 a.m.

Chairman: Leo G. Doerfler, Eye and Ear Hospital, Pittsburgh

The effect of oral responses on listening to competing messages. John C. Webster and L. N. Solomon, U. S. Navy Electronics Laboratory, San Diego

An investigation of the relationship between pure tone and speech reception thresholds. Aram Glorig, Sub-committee on Noise in Industry, Los Angeles

A study of the relationships between measures of speech reception and measures of proficiency in language. Ethel Mussen, Columbus, Ohio, State School

Generalization and extinction in eyelid conditioning to pure tone auditory stimuli. Donald F. Maietta, Allegheny County Schools, Pittsburgh

Simultaneous effects of delayed side tone on skin resistance, reading rate and nonfluencies. Clair N. Hanley, University of Washington

RESEARCH ON CLEFT PALATE

9:00 to 10:25 a.m.

Chairman: McKenzie Buck, University of Florida

The contributions of cephalometric roentgenographic research to speech and breathing. Robert M. Ricketts, Sunset Medical Center, Pacific Palisades, California

A cephalometric study of the growth of soft palate. Jacob D. Subtelny, National Institute of Dental Research, Washington, D. C.

A recent analysis of cleft palate speech. Sylvia Onesti Richardson, Children's Hospital, Boston

An investigation of the attitudes and information possessed by parents of children with clefts of the lip and palate. Milton J. Hill, Kansas State Department of Public Instruction, Topeka

SPEECH CORRECTION IN THE UNITED STATES AND ABROAD

9:00 to 10:25 a.m.

Chairman: Marie Brittin, Seattle

Significant factors in the speech correction programs of various European countries; namely Scandinavia and Great Britian. Caro C. Hatcher, Los Angeles State College.

Recent developments in the rehabilitation of the deaf and hard of hearing in Great Britain. K. M. Jagger, Radcliffe Infirmary, Oxford, England

Speech therapy in Great Britain. C. E. Renfrew, Radcliffe Infirmary, Oxford, England.

Report of national public school speech correction survey and study of state speech correction programs throughout the U. S. Jean Thomas, Flint Public Schools

Discussion

MOTO-KINESTHETIC SPEECH TRAINING

10:30 to 11:55 a.m.

Chairman: Edna Hill Young, Los Angeles

Why the moto-kinesthetic? Edna Hill Young

Use of the moto-kinesthetic in Los Angeles County. Elizabeth Kalman, Crippled Children's Society of Los Angeles County

Demonstration with cerebral palsied child by speech therapist, Crippled Children's Society of Los Angeles County.

The use of the moto-kinesthetic with hard of hearing. Lucelia M. Moore, University of Southern California

The use of the moto-kinesthetic as applied to an aphasic. Paul L. Pfaff, San Diego State College

Recent research at the University of Denver. Ruth M. Clark, University of Denver, Ralph M. Stuek, Denver, and J. D. Tyson, Omaha University

THE RELATIONSHIP OF LARYNGEAL PATHOLOGIES TO VOICE

10:30 to 11:55 a.m.

Chairman: John P. Moncur, University of California, Los Angeles

Speaker:

Joel J. Pressman, Medical School, University of California, Los Angeles

Panel Members:

Virgil A. Anderson, Stanford University
James F. Curtis, State University of Iowa
John C. Snidecor, University of California, Santa Barbara

Discussion

PGSR AUDIOMETRY

10:30 to 11:55 a.m.

Chairman: John H. Gaeth, Northwestern University

Panel Members:

Aram Glorig, American Academy of Ophthalmology and Otolaryngology, Los Angeles
Robert Goldstein, Central Institute for the Deaf
William W. Grings, University of Southern California
William G. Hardy, Johns Hopkins University
John V. Irwin, University of Wisconsin
Jack Rosen, San Francisco Hearing and Speech Center

Discussion

TECHNIQUES OF AUDITORY TRAINING

10:30 to 11:55 p.m.

Chairman: Glenn J. Taylor, Illinois State Normal University

What is trained in auditory training? Miriam D. Pauls, Johns Hopkins Medical Institute

A demonstration of efficiency of auditory training. Richard Brill, Riverside (California) School for the Deaf

Auditory training in preparation for hearing aid selection for young children. Jack Bangs and Tina Bangs, Houston Speech and Hearing Center

The effect of auditory training on educational development. Ciwa Griffiths, Hear Foundation, Los Angeles

STUDIES IN RESPIRATION WITH PARTICULAR REFERENCE TO PROBLEMS IN RESPIRATION ACCOMPANYING CEREBRAL PALSY

10:30 to 11:55 a.m.

Chairman: Richard M. Flower, Cleveland Hearing and Speech Center

A study of some aspects of rib movement during respiration. James Shanks, Indiana University Medical Center

Some observations on the respiration of children with the spastic type of cerebral palsy based on cinefluorographic studies. Richard M. Flower

A technique for improving breathing patterns of athetoid children. Frank Wilson, Northwestern University

Discussion

STUTTERING—A REMARK UPON THE CULTURE

2:00 to 4:55 p. m.

Chairman: Henry Moser, Ohio State University

Moderator:

Lee Edward Travis, University of Southern California

Symposium: *The speaker-listener matrix.*

Stanley Ainsworth, University of Georgia
Bryng Bryngelson, University of Minnesota
Wendell Johnson, State University of Iowa
Joseph G. Sheehan, University of California at Los Angeles
Zelda Wolpe, Beverly Hills

Address:

The unspeakable feelings and thoughts of the stutterer.
Lee Edward Travis

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ISSUES IN ETHICAL PRACTICE

2:00 to 3:25 p.m.

Chairman: Ollie Backus, University of Alabama

Panel Members:

John V. Irwin, University of Wisconsin
Raymond Carhart, Northwestern University
Herold Lillywhite, University of Oregon
Zelda Kosh, Arlington, Virginia

Discussion (Members of the audience are invited to bring written reports of incidents which raise issues regarding ethical practice.)

NON-ORGANIC HEARING LOSS

2:00 to 3:25 p.m.

Chairman: William R. Tiffany, University of Washington.

The audiologist's responsibility in non-organic hearing loss. Leo G. Doerfler, School of Medicine, University of Pittsburgh

The threshold of organic hearing acuity in non-organic hearing loss. Kenneth O. Johnson, Veterans Administration, Washington, D. C.

Functional hearing loss and the physician. Aram Glorig, Sub-Committee on Noise in Industry, Los Angeles

Some common psycho-dynamic factors in psychosomatic deafness. William T. Appell, Columbia University

Discussion

IDENTIFICATION AND EDUCATION OF AURALLY HANDICAPPED CHILDREN

2:00 to 3:25 p.m.

Chairman: Vivian Lynndelle, California State Department of Education

Audio-visual presentation: A state plan for education of aurally handicapped children in the public schools. Vivian Lynndelle

County-wide planning, including identification and instruction as it concerns speech and hearing personnel and remedial classes. Leta W. Timberlake, Santa Clara County Schools, San Jose, California

Day class instruction—elementary grades. Edna Louargand, Arden-Carmichael School District, Carmichael, California

Day class instruction—secondary grades. Mary Jane Braddock, Long Beach (California) Public Schools

RESEARCH IN PROBLEMS OF CEREBRAL PALSY AND OTHER BRAIN INJURIES

2:00 to 3:25 p.m.

Chairman: Frederic L. Darley, State University of Iowa

An analysis of the pitch and duration characteristics of the speech of cerebral palsied individuals. Robert F. Duffey, Marquette University

The relationship between parent attitude and personality development of cerebral palsied children: A pilot study. Empress Young Zedler, Southwest Texas State Teacher's College

Study of speech problems of parkinsonian patients undergoing neurosurgical intervention. Joyce Felstein, New York University, Bellevue Medical Center

A comparison of the language and intellectual function of patients showing unilateral versus bilateral brain damage. Jon Eisenson, Brooklyn College

DETERMINANTS OF VOICE QUALITY

2:00 to 3:25 p.m.

Chairman: William Perkins, University of Southern California

Oral and nasal sound pressure level as related to judged severity of nasality. Arthur Weiss, Junior League Speech and Hearing Clinic, Spartansburg, South Carolina

A goal for voice therapy. William Perkins, University of Southern California

An evaluation by untrained audiences of efficient voice production in terms of good quality. Robert Miller, San Bernardino, California

Some acoustic differences between efficiently and inefficiently produced voices. Granville Sawyer, Huston-Tillotson College

Differences in laryngopharynx adjustments between efficiently and inefficiently produced voices. Peggy Harrison, Southern Methodist University

DELAYED SPEECH

3:30 to 4:55 p.m.

Chairman: Mary Huber, Los Angeles State College

A theoretical consideration of cultural factors in delayed speech. Robert Douglass, Los Angeles State College.

Predicting the persistence of delayed speech. Lois R. Mayper, Children's Medical Center, Boston

Evaluation and interpretation of intelligence factors in delayed speech. Audrey Holliday, University of Washington

A case of environmental delayed speech in five siblings. Anthony Bowie, Hospital for Sick Children, Toronto, Ontario

PARENT EDUCATION

3:30 to 4:55 p.m.

Chairman: Kathleen Pendergast, Seattle Public Schools

An experiment in parent education in a public school speech correction program. Thelma A. Knudson, South Bend, Indiana, Public Schools

Planning and executing a workable program of counseling and guidance for the public school speech correctionist. Leo Buscaglia, Pasadena Public Schools

How television can be used for parent counseling. Jovian Lang, Quincy College

Relationship of parental attitudes to development of speech problems: Implications for counseling. Jane Beasley, Columbia University

Reducing barriers to growth through parent counseling. Ollie Backus, University of Alabama

CONTRIBUTED PAPERS IN AUDIOLOGY: I

3:30 to 4:55 p.m.

Chairman: Robert Goldstein, Central Institute for the Deaf

Inter-tester reliability in tests of children: A comparison of pulse tone and standard techniques of pure tone audiometry. Warren R. Dawson, Stanford University

Language development and training in children with aphasia and hearing impairment. Helmer R. Myklebust, Northwestern University

Vocabulary development of hard of hearing children compared with normal hearing children. Freeman McConnell, The Bill Wilkerson Hearing and Speech Center, Nashville.

Quality—judgment in hearing aid selection. Janet Jeffers, Los Angeles State College

A study of recruitment in ears with abrupt loss of acuity for high frequencies. LeRoy D. Hedgecock, Mayo Clinic, Rochester, Minnesota

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SIDESTONE RESEARCH

3:30 to 4:55 p.m.

Chairman: Dorothy Huntington, Stanford University

(Section incomplete)

CONTRIBUTED PAPERS ON DEAFNESS AND APHASIA

3:30 to 4:55 p.m.

Chairman: To be selected

Neurologic assessment of deaf and aphasic children from the Central Institute for the Deaf. Robert Goldstein and Frank R. Kleffner, Central Institute for the Deaf, and William B. Landau, Washington University Medical School

Idiopathic speech retardation and brain injury in children. Lucy I. Lawson, Franklin Hospital, San Francisco

Goals for the habilitation of the brain injured child should be language rather than mere speech. Caro C. Hatcher, Arcadia, California

An experimental investigation of the effects of sodium amytal on communication of aphasic patients. Michael J. D'Asaro, Culver City, California

An investigation of the perceptual and conceptual abilities of residential school deaf children. Alfred L. Larr, California School for the Deaf, Riverside

General Session of the Association

8:00 p.m. Presidential Address

8:30 p.m. Business Meeting of the Association
Reports of Officers and Committees
Election of Officers and Council Members

Friday, November 18

PROFESSIONAL PROBLEMS

9:00 to 10:25 a.m.

Meeting of State Directors of Speech Correction

9:00 to 10:25 a.m.

Meeting of directors of speech correction in cities over 200,000

APPROACHES TO STUTTERING THERAPY

9:00 to 10:25 a.m.

Chairman: John L. Boland, Jr., University of Oklahoma

The need for a point-of-view in stuttering therapy. Dean Williams, Indiana University

A description and evaluation of a stuttering therapy program. William Trotter, St. Louis University

Play therapy for stuttering children. Betty Ballast, University of Oklahoma

Discussion

INDUSTRIAL AUDIOLOGY

9:00 to 11:15 a.m.

Chairman: Richard Silverman, Central Institute for the Deaf

Panel Members:
Raymond Carhart, Northwestern University
Hallowell Davis, Central Institute for the Deaf
Aram Glorig, Sub-committee on Noise in Industry, Los Angeles
Howard House, Los Angeles
Douglas E. Wheeler, Sub-committee on Noise in Industry, Los Angeles

Discussion

NEW TRENDS AND CONSIDERATIONS IN PROGRAM PLANNING FOR AURALLY HANDICAPPED CHILDREN

9:00 to 10:25 a.m.

Chairman: Donald R. Caziarc, California State Department of Public Health

Hearing and speech impairments: etiology and prevention. Belle Dale Poole, California State Department of Public Health

Developmental patterns and early identification. Arthur H. Parmelee, Jr., U.C.L.A. Medical Center

Individual differences: medical and educational significance. Sidney L. Lasell, University of Southern California School of Medicine

Integrated planning: the essential element in program planning. John J. Beeston, U.C.L.A. School of Public Health

COORDINATED CONSULTATIVE APPROACH TO THE REHABILITATION OF CLEFT PALATE PATIENTS: THE UNIVERSITY OF CALIFORNIA COLLEGE OF DENTISTRY, THE MEDICAL CENTER, SAN FRANCISCO

9:00 to 11:55 a.m.

Chairman: Leon Lassers, San Francisco State College
Coordinator: Charles S. Lipp, School of Dentistry, University of California

Plastic surgery. Harry Blackfield and Raymond Kaufman

Pediatrics. Williams C. Deamer and Peter Cohen

Operative dentistry. Willard C. Fleming and Robert W. Rule, Jr.

Oral surgery. David H. Grimm

Orthodontics. Wendell Wylie, Kenneth Terwilliger, and Rodney Johnson

Prosthetics. Jerome C. Strain

Speech. Lucie Lawson

Social and vocational advisor. Marilyn Willner

Secretary. Esther Bourke

ESOPHAGEAL SPEECH

10:30 to 11:55 a.m.

Chairman: Robert Harrington, Orthopaedic Hospital, Los Angeles

An evaluation of the influence of pitch and extrinsic factors in esophageal speech. Margaret C. Byrne, University of Kansas, and Robert S. Brooks, Salina, Kansas, Public Schools

The program of the International Association of Laryngectomees. Edmund C. Johnson, Los Angeles

(Section incomplete)

COMPETING VOICE MESSAGES: PROBLEMS AND POTENTIAL SOLUTIONS

10:30 to 11:55 a.m.

Chairman: John C. Webster, U. S. Navy Electronics Laboratory

Conflicts among listening, speaking, and motor tasks. T. D. Hanley and Mack D. Steer, Purdue University

Interaction of the human operator and training in voice communications. John J. Dreher and Henry M. Moser, Ohio State University

Effects of time compression upon message efficiency. Grant Fairbanks, Newman Guttman, and Murray S. Miron, University of Illinois

Improvement in message reception due to 'sequencing' competing messages. John C. Webster and L. Sharpe, U. S. Navy Electronics Laboratory

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OBJECTIVES IN TEACHER-THERAPIST PREPARATION

10:30 to 11:55 a.m.

Chairman: John M. Palmer, University of Washington

Panel Members:

Jack L. Bangs, Houston Speech and Hearing Center
Agnes M. Frye, California State Department of Education
Martin F. Palmer, Institute of Logopedics
John C. Snidecor, Santa Barbara College

Discussion

DEVELOPING A CHILD'S APPRECIATION OF SELF, OR OTHERS, AND OF THE WORLD ABOUT HIM THROUGH CLASSROOM SPEECH ACTIVITIES

(Arranged by California Speech Therapy Association)

10:30 to 11:55 a.m.

Chairman: Oma Miles, Fresno County Schools

Panel members:

Ruth Georgian, Fresno County Schools
Mary Bailey, Fresno City Schools
Bonnie Smith, Fresno City Schools
Cornelia Downing, Fresno City Schools

Discussion

APHASIA IN CHILDREN

10:30 to 11:55 a.m.

Chairman: Betty Jane McWilliams, University of Pittsburgh

Panel Members:

Earl Loomis, University of Pittsburgh, School of Medicine
Helmer Myklebust, Northwestern University
J. M. Nielsen, University of Southern California, School of Medicine

Discussion

CONTRIBUTED PAPERS ON HEARING MEASUREMENT

10:30 to 11:55 a.m.

Chairman: Waring J. Fitch, Seattle

Effects of inner ear pathology on aural overload. Phillip A. Yantis, University of Michigan

Some effects of changing time patterns and articulation upon intelligibility and word reception. Gilbert C. Tolhurst, U. S. School of Aviation Medicine, Pensacola

Pilot study on the efficiency of a filtered familiar sounds screening test for three year olds. Marian P. Downs, University of Denver

An experimental investigation of the effects of certain auditory and visual stimuli upon the autonomic equilibrium of hearing handicapped, emotionally handicapped, and non-handicapped adolescents as measured by psycho-galvanic-skin-resistance audiometry. Adam J. Sortini, Children's Medical Center, Boston

Discussion

COUNSELING PARENTS OF YOUNG STUTTERERS

2:00 to 3:25 p.m.

Chairman: Frank Robinson, Miami University

Basic principles and skills in counseling parents. James Bugental, Los Angeles

Special problems associated with counseling parents of young stutterers. Frederic Darley, State University of Iowa

'The story of Tim' and other supplemental aids to counseling parents of young stutterers. Orville W. Wensley, Oregon State Department of Education

Discussion

DEMONSTRATION OF PUBLIC SCHOOL TECHNIQUES

2:00 to 4:55 p.m.

Chairman: Sara Stinchfield Hawk, Los Angeles State College

A developmental approach to functional articulatory speech problems in the kindergarten through in-service education of classroom teachers. Nadine Hermanson Coates, Los Angeles County Schools

Use of an original speech training unit in speech correction. Faith Jolly, Pomona City Schools

The Plasticon Board as an aid in speech correction. Helen Herzig, Covina (California) Public Schools

Use of the tachistoscope in functional speech disorders. Mary Hobson Crow, Glendale Unified School District

Teaching speech with the telephone. Windell Melton, Los Angeles City Schools

Teaching speech with music. Sybil Watkins, Los Angeles City Schools

Teaching speech with puppets. Edith Beckman, Los Angeles City Schools

Rhythm demonstration. Anna Wevill, Orange County Schools

Discussion: Led by Lester Harris, Whittier College, California

CONDUCTIVE DEAFNESS

2:00 to 3:25 p.m.

Chairman: Jacqueline Keaster, Childrens Hospital, Los Angeles

Experimental audiometry in animals. Arthur L. Holcumb, Cedars of Lebanon Hospital, Los Angeles

Stapediolysis and fenestration in otosclerotic surgery. Victor Goodhill, Cedars of Lebanon Hospital, Los Angeles

The relationship of adenoid tissue to the incidence of hearing loss in children with cleft palate. Fred Linthicum, Sanford Dietrich, and Jacqueline Keaster, Childrens Hospital, Los Angeles

The increased incidence of serious otitis and conductive deafness. Seymour J. Brockman, Childrens Hospital, Los Angeles

APHASIA REHABILITATION

2:00 to 4:55 p.m.

Chairman: Robert Harrington, Orthopaedic Hospital, Los Angeles
Presiding: Mrs. Aaron Agronowitz, Long Beach

Types of aphasia problems. J. M. Neilsen, University of Southern California, School of Medicine

Illustrative case histories. John Wagner, Veterans Administration Hospital, Long Beach

Presentation of case demonstrations. Milfred McKeown, Clark Harada and Donald Ellis, Veterans Administration Hospital, Long Beach

Discussant: J. Paul FitzGibbon, Long Beach

INTER-RELATIONSHIPS OF LANGUAGE FUNCTIONS

3:30 to 4:55 p.m.

Chairman: Harriet Kopp, Detroit

Speech and the emerging reading readiness process. Lyman M. Partridge, Central Washington College

Remedial reading techniques in the speech clinic. Morris Val Jones, May T. Morrison Center for Rehabilitation, San Francisco

The role of the classroom teacher in the developmental and preventive aspects of an integrated speech and hearing program in the public schools. Gerald L. Giles and Joseph Hendrickson, Contra Costa County (California) Schools

Dyslexia and the psychology of language development. Helmer Myklebust, Northwestern University

ROLE PLAYING AS A TECHNIQUE IN SPEECH CORRECTION

3:30 to 4:55 p.m.

Chairman: Sue Earnest, San Diego State College

Role playing as a release technique with parents. Margaret Gardner, San Diego State College

Values of role playing. Robert Bartlett Haas, University of California at Los Angeles

(Section incomplete)

BONE CONDUCTION AND RECRUITMENT

3:30 to 4:55 p.m.

Chairman: Moe Bergman, Hunter College

Panel Members:

Raymond Carhart, Northwestern University
Hallowell Davis, Central Institute for the Deaf
John Keyes, University of Oklahoma
Norman A. Watson, University of California at Los Angeles

Discussion

THE SEVERELY HARD OF HEARING OR DEAF CHILD IN SCHOOL AND COMMUNITY

3:30 to 4:55 p.m.

Chairman: Priscilla Pittenger, San Francisco State College

The child with severe aural impairments and hearing classes. Lucile Hallet, Bakersfield, California

Use of elementary school techniques to develop language and speech of deaf children. Leahea Grammatico, San Jose City Unified Schools, California

The pre-school deaf child. Patricia Stafford, John Tracy Clinic

A community survey of deaf children. Lucie Lawson, San Francisco State College

TREATMENT OF STUTTERING PROBLEMS IN THE PUBLIC SCHOOLS

3:30 to 4:55 p.m.

Chairman: Ruth Beckey Irwin, Ohio State University

Direct or indirect therapy for the young stutterer. Dorathy Eckelmann, Illinois State Normal University

Problems of the teen-age stutterer in the public schools. Arden H. Christensen, Los Angeles Public Schools

How the classroom teacher and speech therapist can cooperate in helping the public school stutterer. Sibyl Gholson, Texas Education Agency

Administrative problems in connection with stuttering problems in the public schools. Margaret Hall Powers, Chicago Public Schools.

Discussion

STUDIES IN CONDUCTIVE DEAFNESS

3:30 to 4:55 p.m.

Chairman: To be selected

Reliability of auditory-distortion measurement by an exploring-tone method. Charles Lightfoot, Northwestern University

The effect of static air pressure in the external auditory meatus on hearing acuity. Ronald G. Hansen, Ohio State University

The use of middle ear prosthesis in conductive deafness. Max E. Pohlman, Los Angeles

Tolerance thresholds for selected etiological categories of conductive deafness. Bernard M. Anderman, Veterans Administration, New York

Meeting of the Executive Council
8:00 p.m.

Saturday, November 19

CONTRIBUTED PAPERS ON STUTTERING

9:00 to 10:25 a.m.

Chairman: Victor P. Garwood, University of Southern California

Observations of the effects on stutterers of reserpine and chlorpromazine: A preliminary report. Lynwood Heaver, Roy W. Franklin, and Godfrey E. Arnold, National Hospital for Speech Disorders

A study of the interrelationships among manifest anxiety, manifest hostility, rigidity, duration of therapy, and severity of stuttering within a group of stutterers. Janine Krantz, Indiana University Medical Center

A comparative study of the physiological measures of anxiety in stutterers and nonstutterers in anticipation of a speaking situation. Kathryn Barth Horton, Vanderbilt University

Utilizing the team approach in working with young children with stuttering symptoms. John S. Wortley, Hudson River Speech Center

Discussion

VOCAL THERAPY AND SOME RECENT RESEARCH ON VOICE

9:00 to 10:25 a.m.

Chairman. To be selected

Therapeutic applications of the glottal attack in certain dysphonias. James Mullendore, University of Virginia

An objective index of nasality. Gordon M. Low, San Francisco State College

An experimental study of the diagnostic value of vocal cues in psychosis. Florence A. Sharp, Beverly Hills, California

A study of the effect of vowels, some selected consonants, and type of vowel initiation on the perception of harsh voice quality. Maryjane Rees, Sacramento State College

Thirty hoarse voices. John L. Boland, Jr., University of Oklahoma Medical School

THE Rh CHILD: DEAF OR 'APHASIC'?

9:00 to 10:25 a.m.

Chairman: Hayes A. Newby, San Francisco Hearing and Speech Center

Panel Members:

Victor Goodhill, University of Southern California Medical School
Jack Rosen, San Francisco Hearing and Speech Center
Helmer R. Myklebust, Northwestern University
Peter Cohen, University of California School of Medicine and Helen Hannigan, Charles E. Whitton School, Oakland

Discussion

THE PERCEPTION OF SPEECH: SOME EXPERIMENTAL APPROACHES

9:00 to 10:25 a.m.

Chairman: Gordon E. Peterson, University of Michigan

The perceptual recognition of words. Leo J. Postman, University of California at Berkley

Isolating the acoustic cues for place and manner of articulation by synthesis. Pierre Delattre, University of Colorado, Alvin M. Liberman, University of Connecticut, and Franklin S. Cooper, Haskins Laboratories.

CLEFT PALATE SPEECH THERAPY

9:00 to 10:25 a.m.

Chairman: J. M. Ball, University of Pittsburgh

Speech training for the young cleft palate child. Gretchen M. Phair, Wisconsin Department of Public Instruction

Some special considerations in speech therapy for cleft palate cases. Charlotte Wells, University of Missouri

Suggested criteria for determining the need for a prosthetic appliance as a speech aid. D. C. Spriestersbach, State University of Iowa

Discussants:

Mildred F. Berry, Rockford College
Robert W. Blakely, University of Oregon
Jack Matthews, University of Pittsburgh

CONTRIBUTED PAPERS IN AUDIOLOGY: II

10:30 to 11:55 a.m.

Chairman: Miriam D. Pauls, Johns Hopkins Medical Institute

A study of the visual memory of deaf and hearing children. Francis X. Blair, Eye and Ear Hospital, Pittsburgh

Auditory threshold acuity of cerebral palsy children by PGSR and other techniques. Irwin Lehrhoff, Children's Hospital Society, Los Angeles

Figure-ground function in auditory and visual perception in normal and psychopathic persons. Thomas C. Camp, Saint Alban's Sanatorium, Radford, Va. and Richard A. Winchester, Veterans Administration Hospital, San Francisco

Differential diagnosis of hearing problems of adult patients. Harriet L. Haskins, Johns Hopkins Hospital

An audiological and otological investigation of normal hearing individuals with a family history of clinical otosclerosis. A. Bruce Graham, Henry Ford Hospital, Detroit

THE RELATIONSHIP BETWEEN ARTICULATORY DISORDERS AND PERSONALITY

10:30 to 11:55 a.m.

Chairman: Margaret Hall Powers, Chicago Board of Education

What has research contributed to date on the relationship between articulatory disorders and personality? Duane C. Spriestersbach, State University of Iowa

A comparison of personality test scores of adults with articulation and non-articulation disorders. George H. Shames and Jack Matthews, University of Pittsburgh

Research needs and possible approaches in the relationship between articulatory disorders and personality. Robert Milisen, Indiana University

An experimental approach to the role of emotional factors in functional articulatory disorders. Lee E. Travis, University of Southern California

SPEECH EDUCATION IN THE PUBLIC SCHOOL: CLASSROOM DEMONSTRATIONS

(Arranged by California Speech Therapy Association)

10:30 to 11:55 a.m.

Chairman: Verna Brienholt, Orange County (California) Schools

Elementary students—Theodore Roosevelt School, Compton. Myra Jane Taylor, Compton (California) City Schools

Junior high students—Orange County Schools. Verna Brienholt

RECENT RESEARCH IN APHASIA

10:30 to 11:55 a.m.

Chairman: Wallace A. Goates, University of Utah

Aphasia in infantile cerebral palsy. Philip N. Hood, Dallas Speech and Treatment Center

Certain problems and findings in a study of aphasia. Ralph M. Reitan, Indiana University Medical Center

The role of counseling in a language therapy program for dysphasics. Irwin Brown and Margaret Schilling, University of Michigan

Extent of recovery from aphasia of a group of older chronically disabled hospital patients: A case study report. Jane Dorsey Zimmerman, Teachers College, Columbia University

Business Meeting

2:00 to 3:25 p.m.

EXPERIMENTAL PHONETICS

3:30 to 4:55 p.m.

Chairman: Forrest M. Hull, The Bill Wilkerson Hearing and Speech Center

Utilization of linguistic principles in speech compression. James L. Flanagan, Massachusetts Institute of Technology

Physiological and kinesthetic correlates to force of articulation. André Malécot, University of California at Riverside

Nasality in speech: Articulatory and perceptual studies using a vocal tract analog. Kenneth N. Stevens and Arthur S. House, Massachusetts Institute of Technology

EVALUATION OF AUDIOMETRIC AND INSTRUCTION TECHNIQUES FOR PRE-SCHOOL CHILDREN WITH SEVERE HEARING IMPAIRMENTS

3:30 to 4:55 p.m.

Chairman: William G. Hardy, Johns Hopkins University

Techniques for testing hearing of pre-school children. Sylvia Morgan, Columbia-Presbyterian Medical Center

An evaluation of play audiometry of young children. Edgar L. Lowell, Georgia Rushford, Gloria Hoversten, and Marguerite Stoner, John Tracy Clinic

A motion picture film, '*Too Young to Say*,' illustrating the play audiometric techniques used at the John Tracy Clinic, will be shown

A survey of 5,000 children with severe hearing impairment enrolled in the John Tracy Clinic correspondence course. Georgia Rushford, Edgar L. Lowell, and Harriet Montague, John Tracy Clinic

APPLYING RESEARCH METHODOLOGY AND INSTRUMENTATION TO PUBLIC SCHOOL SPEECH THERAPY

3:30 to 4:55 p.m.

Chairman: Ruth Montgomery Jackson, Palo Alto (California) Unified School District

Panel members:

Margaret Hall Powers, Chicago Public Schools
Lucie Lawson, Franklin Hospital, San Francisco
Mack Steer, Purdue University

Papers will be read by speech therapists, followed by critiques by members of the panel of experts. Papers on this program will be selected later.

THE MANAGEMENT OF CEREBRAL PALSIED CHILDREN

3:30 to 4:55 p.m.

Chairman: Murray M. Halfond, Temple University
Presiding: Herold Lillywhite, University of Oregon

Perceptual disturbances in children with cerebral palsy. Nancy E. Wood, Cleveland Hearing and Speech Center

The team approach in cerebral palsy rehabilitation. Richard L. Sleeter, Medical School, University of Oregon

Environmental factors in the management of cerebral palsy children. Betty Jane McWilliams, University of Pittsburgh

Methods of diagnosing speech problems. James Shanks, Medical School, University of Indiana

Meeting of the Executive Council

3:00 p.m.

California Speech Therapy Association Events

November 16—Board Meeting, 6:00 p.m.
November 17—Board Meeting, 6:00 p. m.
November 18—Business Meeting, 5:00 to 7:00 p.m.
November 19—Association Luncheon

SPECIAL CONVENTION FEATURES AND ANNOUNCEMENTS

Visit to John Tracy Clinic. Staff members of the John Tracy Clinic for deaf and hard of hearing children will conduct two tours through the school and present lectures and demonstrations of their work with children. These are scheduled for Friday, November 18, from 9:00 a.m. to 10:30 a.m. and from 10:30 a.m. until noon. Only a limited number can be accommodated. Tickets will be available at the main convention desk. Transportation will be arranged. The John Tracy Clinic will maintain a hospitality room during the convention where those interested can meet with and question members of the staff. Announcement of the place will be printed in the official convention program.

Film Theatre. The Film Theatre will be scheduled on Thursday, November 17, and Friday, November 18, from 2:00 p.m. to 5:00 p.m. Victor Garwood will be in charge, with William Carver assisting. A mimeographed bibliography of films will be given to each member attending. A feature of the theatre will be the U.P.A. release, 'Gerald McBoing-Boing.'

California Speech Therapy Association. The American Speech and Hearing Association is happy that CSTA is meeting jointly with it. Special events of interest to members of the CSTA will be found listed at the end of the ASHA program. The California State Board of Education has agreed to sponsor the joint meetings and a notice concerning this sponsorship will be sent to all school superintendents in the state.

Visits to Noise in Industry Laboratory. The laboratories and headquarters of the Subcommittee on Noise in Industry will be open for inspection during the convention. Dr. Aram Glorig is in charge of the study on relations of hearing loss to noise exposure. Transportation will be arranged.

Where to Eat and What to Do and See. At the Hospitality Desk in the lobby of the convention hotel, maps and information on tours and points of interest in and around Los Angeles will be provided by the Los Angeles Chamber of Commerce and the Automobile Club of Southern California.

If You Plan to Drive to the Convention. The Automobile Club of Southern California will provide a full set of marked maps showing the best routes from your point of departure to Los Angeles. A postcard requesting this service should be addressed to Dr. Victor Garwood, Speech and Hearing Clinic, University of Southern California, Los Angeles.

If You Plan to Bring Your Family. To obtain information on places to stay, tours and locations which will be of interest to those not attending professional meetings, send a card to Dr. Victor Garwood.

Certification Desk. The Committee on Clinic Certification will maintain a desk where a member of the committee will be available to answer questions of a general or specific nature on certification each day of the convention from 9:30 a.m. to 11:55 a.m. and from 2:00 p.m. to 5 p.m.

Registration Desk. The registration desk will be open beginning at 1 p.m. Wednesday, November 16 and will open at 8 a.m. Thursday, November 17. Every effort will be made to prevent the necessity of long waiting in line. The Program Committee is attempting to make arrangements for pre-convention registration by mail, but this may not prove feasible.

Hotel Information. Information concerning hotel accommodations will be mailed to each member of the Association.

Teaching Materials and Exhibits. In addition to commercial exhibits of apparatus, publications and materials, there will be an exhibit of non-commercial materials. Members who have materials which they would like to share with other members of the profession should write Dr. John Moncur, 310 Royce Hall, University of California, Los Angeles 24.

Organization and Alumni Events. Special meetings and informal open houses sponsored by various colleges and universities and organizations will be listed in the convention program. Those wishing to arrange such events should write the chairman of the program committee, James Carrell, University of Washington, Seattle.

Masseter Muscle Action Potentials In Stuttered And Non-Stuttered Speech

Dean E. Williams

It is the purpose of this paper to review previous electromyographic studies of stutterers and to supply further experimental evidence and evaluational considerations which define and limit the possible interpretations of data obtained in such investigations. A re-examination of previous relevant studies is deemed necessary because in some of them electromyographic differences between stutterers and non-stutterers have not only been reported, but they have also been interpreted as basically etiological in significance.

West, Kennedy, Carr, and Backus (*47*) refer to the electromyographic data as evidence of a so-called dysphemic condition existing within the stutterer. The discussion of stuttering by Van Riper (*44*) makes extended use of these data. He reports that stuttering can result 'from any of three etiologies or combinations thereof.' One of these is 'a background of dysphemia.' He continues:

> The importance of the concept of dysphemia is that it explains the stutterer's speech interruptions in terms of a nervous system which breaks down *relatively easily* in its integration of the flow of nervous impulses to the paired peripheral muscles [of each side] . . . In some stutterers these arrival times are disrupted; they are not synchronized.

Electromyographic studies of stuttering. The hypothesis that stuttering is characterized by the asynchronous arrival of nerve impulses in the bilaterally paired jaw muscles received its first systematic expression by Travis (*41*) in 1931. It was in 1934, however, that experimental data relevant to this specific contention were published (*42*). Travis obtained these data by using the electromyographic technique to record action potentials from the left and right masseter muscles of 24 adult stutterers and 24 adult non-stutterers. The action potentials recorded from the two sides were compared for instant of appearance, frequency, intensity, duration, and general patterning. He reported that 22 of the non-stutterers registered action potentials which were 'practically identical' on the two sides of the jaw. The action potentials for two non-stutterers were bilaterally dissimilar. In contrast, the bilateral action potentials for 18 of the 24 stutterers were 'strikingly different' in the respects named above. During the non-stuttered speech of all stutterers, and during the stuttering of six of them, the action potentials were 'normal.'

Travis offered two main conclusions: (1) 'This implies [for the non-stutterers] that the two muscles (the

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two sides of the speech mechanism) were receiving essentially the same innervation in spite of the bilateral origin of their nerve supply and were equally capable of responding to that innervation.' (2) 'It is certain [for the stutterers] that either the muscles were not receiving the same or similar innervation or they were not capable of responding equally to such innervation.'

There were two studies reported in 1935 in which the investigators were also concerned with electromyographic recording during stuttering.

In the first study, Strother (*40*) obtained electromyograms from the masseter muscles of 31 adult stutterers as they repeated words presented verbally by the experimenter. No control group was used. Strother presents no criteria for his judgment of 'asymmetrical action currents.' A review of his tables indicates that during the stuttered speech of 31 subjects, five had bilateral 'asymmetry' 100 per cent of the time, five had such 'asymmetry' none of the time, 14 over 50 per cent of the time, and 17 under 50 per cent of the time. He concluded that stutterers have 'action current abnormalities' but, because of the large number of stutterings in which no abnormalities occur, there is 'necessarily (sic) no direct relationship between the action current abnormalities and the overt spasm.'

In the other study, Morley (*25*) recorded action potentials from the masseter muscles of 10 adult stutterers as they read orally. There was no control group. Action potentials recorded bilaterally were judged to be 'abnormal' according to the following criteria: (1) greater amplitude on one side than on the other, and (2) greater unilateral amplitude alternating from side to side. Morley reports that abnormalities occurred during approximately 25 per cent of the total speaking time; however, 35 per cent of the abnormalities were unrelated to stuttering moments, occurring instead during non-stuttered speech.

The EMG findings from 10 stuttering and 10 non-stuttering children were reported by Steer (*39*) in 1937. Action potentials were recorded from the masseter muscles of each subject. Although no definition is stated, Steer's concept of 'asynchronous action potentials' seems to be concerned mainly with the frequency and duration of volleys. He reported that six of the non-stutterers and five of the stutterers show bilateral action potentials which were 'practically identical.' During the speech of four non-stutterers and four stutterers, the action potentials were bilaterally asynchronous. (Also, for one stutterer they were reportedly absent.)

A comparison of the findings from these studies discloses several discrepancies. Travis describes the bilateral action potentials during moments of stuttering as 'strikingly different' and those of the non-stutterers as 'almost identical.' However, he presents no quantification of his data nor does he give a detailed account of his judging procedure. Evaluation of his reported results, therefore, is more meaningful when his findings are compared with those from other studies. Strother and Morley do not report findings as positive as those of Travis. For example, they report bilateral abnormalities in both stuttered and non-stuttered speech of stutterers. They found no consistent relationship between these

abnormalities and moments of stuttering. Moreover, in the absence of control groups, there is no basis for deciding whether the findings of Strother and of Morley might be different from those obtainable from non-stutterers. Steer reports that stuttering children have action potential disintegrations during stuttering, but that non-stuttering children do also during normal speech, and to approximately the same degree.

Problems in electromyography. It is assumed in these studies that if, at any given moment, the bilateral action potentials are not 'practically identical,' this represents an 'abnormality.' 'Practically identical' is not clearly defined, however, and it is therefore not possible to consider very effectively the meaningfulness of the label 'abnormality.'

The problem of what constitutes an abnormal action potential pattern is still a bothersome one today, primarily because not enough is known of the normal functioning of human muscle (*11*). Electromyography, for the most part, has been used in studying nerve and muscle pathology (*3, 15, 19, 20, 30*), gross action of muscles (*10, 21, 22,*) and single motor unit functioning (*16, 29, 32, 38*). The criteria of a normal, or abnormal, relationship between bilaterally homologous muscles have not been clearly determined.

Weddell, Feinstein, and Pattle (*46*) have studied the characteristics of action potentials obtained from an injured or pathological facial muscle. Their findings are summarized as follows:

1. Greatly reduced action potentials under conditions of contraction.
2. No action potentials during flexion.
3. Fibrillation (extremely rapid, jerky action potential pattern even under conditions of rest).
4. Vigorous action potentials soon dying to zero regardless of whether the muscle is in a state of contraction or is at rest.
5. Constant repetitive action potentials unaffected by contraction.

These characteristics are different from those which, according to Travis (*42*), dichotomize stutterers and non-stutterers. Thus, it may be inferred that the 'abnormalities' found in the stutterer's record are not due to injury or pathology of the muscle tissue. This inference gains added support from the fact that action potentials of injured or pathological facial muscles have relatively constant characteristics throughout the entire record (*24, 46*). Action potentials recorded from stutterers have both 'normal' and 'abnormal' patterns within the same record.

On the other hand, the term 'abnormality' apparently has been applied to the bilateral dissimilarities in the stutterer's record. Also, it seems that an hypothesis has been assumed that these dissimilarities, or factors of which they are presumably symptomatic, contribute etiologically to stuttering. If this interpretation is accurate, then the following review of research is pertinent.

Dysinger (*13*) recorded action potentials bilaterally from the platysma muscles of a patient diagnosed as having a lesion in the central nervous system. The platysma muscles were selected in this instance because there was a marked contraction of these muscles with a drawing downward of the head and jaw during speech. The speech was defective although the pa-

tient was not reported to be a stutterer. The electromyograms obtained bilaterally from the neck muscles showed that 'the action currents on the right side were much larger than those on the left side of the neck.'

Maxwell and Waggoner (*24*) reported several cases with unilateral hypertrophy of the masseter muscles. The hypertrophy consisted of an excessive development or growth of one of the masseter muscles. Electromyograms obtained bilaterally from these muscles showed greatly reduced action potentials on the hypertrophied side. Furthermore, this unilateral reduction remained constant throughout the record. It was learned through personal correspondence with Waggoner that none of the subjects stuttered or had a speech defect of any kind.

These research reports indicate that it is possible for an individual to produce bilaterally dissimilar recordings of action potentials without concomitant stuttering.

The generalizations made from the EMG studies of stutterers imply that the action potential, when obtained from surface electrodes, is an indicator of the arrival and/or the relative strength of nerve impulses in the muscle. Moreover, the purposes and designs of several related experiments assume this relationship. For example, Orton and Travis (27), Warren (*45*), Patterson (*28*), Travis, Tuttle, and Bender (*43*), investigated the simultaneity of arrival of nerve impulses in bilaterally paired muscles. They used electromyography with skin electrodes to determine, presumably, which muscle first received nerve impulses. Furthermore, in a study of contraction latency(with special reference to stuttering), Shackson (*34*) spoke of 'nerve impulse or action current.' These terms were used synonymously.

Perhaps the most pointed statement of the equivalence of action potential and nerve impulse has been made by Van Riper (*44*), who says, 'the action currents (which accompany nervous impulses from the brain) do not appear simultaneously [in the bilaterally paired muscles].'

The assumption that 'action currents' (now more accurately called 'action potentials') are indicators of the arrival of nerve impulses in the muscle becomes highly questionable upon examination of electromyography as a research technique. Bozler (*4*), Richardson (*30*), and Golseth (*15*), among many others, are careful to point out that the action potential represents a manifestation of the electricity generated by muscle contraction. Roseman (*31*) states this concisely:

> The isolated muscle tissue developes its own electrical vibration by its excitement, without the assistance of the motor nerve endplate, and conducts it forth in the form of its own action current from cross section to cross section.

Even so, if action potentials are recorded from a single muscle *fiber* with a needle electrode, they may be assumed to correspond to the nerve impulse which the fiber receives (*1*, *14*, *46*). That is, if a muscle fiber is stimulated 15 times per second, its action potential record will show a series of spikes appearing with a constant amplitude at 15 cycles per second. However, when recording is made from the entire muscle, or from a group of muscles, the relationship becomes exceedingly complex.

Although there has been no count of the number of muscle fibers per

motor unit in facial muscle, Clark (*5*) discovered from 30 to 300 fibers in motor units of limb muscle. This means that motor units vary in size within the same muscle. Action potentials recorded simultaneously from two or more motor units within a normal muscle vary in frequency and appear to be constantly asynchronous or out of phase (*18, 30*). Thus, according to Shields and Kuitert (*37*), measurements of frequency become meaningless under these conditions because of the unknown coalescing effect. Amplitude and duration of action potentials may also vary when recorded from different motor units within the same muscle (*46*). A clarifying summary of relevant findings has been given by Hoefer and Putnam (*18*):

> Correspondingly during sustained effort frequencies are not constant but either vary in some of the units or decrease and increase in others independently . . . At times certain leads were not active at all, and at other times they started to discharge without any perceptible change in the condition of the experiment.

Thus, when action potentials are recorded from an entire muscle mass, as they are with skin electrodes, it becomes evident that characteristics of the nerve impulse bear no constant relationship to the obtained record.

It appears that the action potential 'abnormalities' obtained from stutterers cannot be attributed to a lack of simultaneity of arrival of the bilateral nerve impulses in the homologous muscles, or to inequality of their respective strengths, as stated by Van Riper and others. The measurement of such differences would appear to lie beyond the scope of electromyography as applied in the stuttering research under review.

Behavioral conditions affecting action potenital response. Consideration should also be given to the effect of behavior upon the resultant action potential response. If changes in the EMG can be obtained by varying the behavior of the subject, then this becomes an important variable which limits the validity of the attempt to ascribe etiological importance to all EMG changes.

Shaw (*35, 36*) and Bagchi (*2*), by the use of electromyography, observed muscular activity in the arm during imaging. They found that during rest there were no recordable action potentials, but when subjects were asked to image the movement of an arm holding a weighted object, action potentials were immediately observable. Davis (*8*) demonstrated that with an increasing 'set' to respond to a stimulus, the amplitude of the action potentials showed a corresponding increment. He also reported that in a problem-solving situation, an increase in the difficulty of the problems and, hence, an inferred increase in the frustration experienced, augmented the action potential activity (7). In another study, Davis, (*9*) reported variations in action potential responses which were closely allied to changes in the state of tension of the subject. Moreover, he concluded that both amplitude and patterning of response are a function of tension.

The behavioral influence on the action potential record has also been found in studies of bilaterally paired muscles. Liebesny and Blutstein (*23*) recorded EMG's from 'symmetrical muscles contracting synchronously but with unequal force.' The results were:

> Symmetrical muscles contracting synchronously but with unequal force show

> reciprocity in the degree of contraction. Muscles working against resistance exhibit markedly increased amplitude of the EMG . . . However, the symmetrical muscles of the other side contracting without resistance show reciprocally diminished amplitudes to more than one half of the size shown when both muscles worked synchronously with equal force.

Moyers (*26*) used electromyography in studying the muscles involved in mandibular movement. A portion of the study was concerned with the closure pattern of the mandible during the period of transition from primary to permanent dentition. Bilaterally recorded action potentials were obtained from the temporalis muscles of nine subjects before, during, and after the loss of the primary ('baby') teeth. Comparisons of these records indicate a relatively constant, although not symmetrical, bilateral relationship before and after exfoliation. During exfoliation, however, this relationship is disrupted by frequent unilateral changes in the action potential pattern. These changes are explained as indicative of 'temporomandibular adjustments to the arrival of new teeth.'

Thus, in electromyographic research there is evidence to indicate a behavioral influence on the action potential record. This variable gains possible significance in the light of clinical observations of stutterers. In stuttering behavior there is often considerable jaw activity which is different from and in addition to, or superimposed upon, the jaw movement sequence observed in normal speech production.

Electrode placement. To date there seems to be considerable indecision as to the preferred placement of skin electrodes (*33*). The problem revolves around the task of interpreting the action potential response. It has been observed by Hodes, Larrabee, and German (*17*) that 'the action potential of a particular muscle could be detected through electrodes placed not only on the skin overlying it, but also on skin over nearby muscles.' The consequence of this, as they suggest, is the extreme difficulty of measuring accurately the action potentials of one muscle when neighboring ones are in action simultaneously. The result is an unknown summation of all their contributions. Denny-Brown (*11*) concurs in these observations in stating, ' . . . if a muscle is the seat of an intense discharge its electrical activity can be recorded with ease from totally inactive or denervated muscle 10 or even 15 cm. away.'

These observations are complicated by the variability of electrical discharge within each muscle. By the use of needle electrodes, it has been discovered that during muscular contractions, motor units in a given muscle vary in electrical intensity from vigorous electrical discharges to relative inactivity (*6, 12, 18*). From this it may be inferred that the relative proximity of a skin electrode to the various motor units involved is a factor in that electrode's response.

In the EMG studies on stuttering, it is seen that the investigators obtained only one recording from each side of the jaw. It necessarily follows that the assigning of relevant significance to any differences found between the two experimental groups must be based upon two assumptions: (1) the action potentials were being recorded from *only one* muscle on each side, and (2) the one record represented a definitive primary action potential for that functional muscle (composed of many motor units).

This, of course, assumes the existence of *a* primary action potential which corresponds to the electrical discharge of an entire muscle mass, and which presumably corresponds to the bilaterally synchronous arrival of nerve impulses from the brain. The electromyographic research already presented would indicate that these assumptions are untenable.

Problem

It has been indicated that in previous electromyographic research on stuttering a number of apparently important methodological factors and experimental variables have been essentially disregarded or uncontrolled.

As yet, no attempt has been made to compare, quantitatively, the bilaterally recorded action potentials fom the jaw muscles of stutterers and non-stutterers within an experimental design allowing for the determination of the effects of jaw movement and electrode placement. The present study was intended to make such comparisons possible.

The purpose of this research, then, was to compare young adult stutterers and non-stutterers with respect to bilaterally recorded action potentials of the jaw muscles.

The hypothesis to be tested was that any electromyographic differences between stutterers and non-stutterers obtained under the conditions of the present study may be accounted for by reference to the following variables: (1) variations in patterns of jaw movements, and (2) differences in electrode placement.

Procedure

Subjects. Fifteen adult stutterers and fifteen adult non-stutterers served as subjects in this experiment. The stutterers were attending the Speech Clinic at the University of Iowa. The non-stutterers were students majoring in speech pathology or other students familiar with stuttering.

Electrode placement. Each subject was asked to report for one experimental period. Two pairs of surface electrodes were placed on each side of the jaw in an area assumed to lie over the masseter muscle.[1] This area was determined by palpation; the subject voluntarily contracted the jaw muscles and the experimenter located the point of greatest contraction (swelling). The electrodes consisted of circular silver disks seven millimeters in diameter. The first two electrodes were positioned on the jaw one centimeter apart in a vertical relationship. The second two were positioned in a similar relationship, one centimeter anteriorly to the first pair. Thus, the electrodes were placed on each side of the jaw in such a way that they constituted the corners of a square with one centimeter sides and all equidistant from a point determined as the center of muscle contraction (swelling). Records were taken from each of the two vertically placed pairs on each side. Hence, two electromyograms were obtained from each side of the jaw.

Recording apparatus. The subject was seated in an easy chair in an electrostatically shielded room with one door, and one window for observation by the experimenter. The elec-

[1]The masseter was used as the reference muscle; however, it is recognized that adjacent muscles such as the zygomaticus, risorius, obicularis oris, and perhaps others also contributed necessarily to the record.

trode leads were fastened to a terminal box which in turn was connected to the amplifier inputs of a Grass Model III electroencephalograph. This instrument was equipped with moving coil permanent magnet oscillograph units that had a flat frequency response up to approximately 70 cycles per second and an absolute cut-off at about 150-200 cycles per second. The recording paper moved at a constant rate of 60 millimeters per second, providing accurate time measurements to four milliseconds. The amplifier response in the recorder, using EMG time constants, was essentially linear between 20 and 200 cycles per second.

Four channels of the instrument were used in recording action potentials. Hence, four simultaneously obtained electromyograms, two from the left and two from the right side, were routinely recorded. One channel recorded a silent signal introduced by a hand key for marking moments of stuttering or other experimental intervals, and one channel activated a voice key connected to a microphone placed near the subjects for marking the presence or absence of speech.

Experimental conditions. Action potential records were obtained under two conditions. In one condition the subject was speaking and in the other he was performing prescribed jaw movements. The speech sample consisted of two-or three-syllable words which were presented to each subject in the two groups, one word at a time. Each word was printed in large letters on a three-by-nine-inch card. While sitting at the recorder, the experimenter showed the subject each card through an open window. The words were read at a distance of six feet; the subjects had no difficulty in reading them at this distance.

Twenty cards, with one word on each card, were presented one at a time to each subject in the non-stuttering group. Ten of these words were underlined. The subject was instructed to 'fake'[2] stuttering on these underlined words and to speak normally the non-underlined words. The order of presentation of these cards was randomly determined.

Each subject in the stuttering group was presented word-cards, one at a time, until he had spoken ten of the words with stuttering and ten of them without stuttering.

There was an additional condition for the stuttering group. Each stutterer received a practice period, if necessary, in which he learned to stutter in an effortless, relaxed pattern of repeating the first syllable of the word. This has, at various times, been called the 'bounce pattern' of stuttering. This pattern was selected because of its emphasis on activity with a minimum of overt muscular tension. Following this practice period, each subject was shown additional word-cards and was instructed to stutter with the easy, repetitious pattern on any word upon which stuttering occurred. Word-cards were then presented until each subject had spoken six of the words in accordance with the instructed method of stuttering.

With the recorder turned on, a word-card was introduced and at the same time the experimenter said, 'Here.' He counted silently, 'One thousand, two thousand,' and said,

[2]To fake stuttering is to imitate stuttering or pretend to stutter on a given word.

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'OK,' at which time the subject responded. The subject was instructed to assume physiological rest between word presentations.[3] Following an approximate three-second pause, the next presentation was made. The procedure was continued until the speaking of the words had been completed according to requirements of the study. At this time, the recorder was turned off.

During the procedure explained above, the experimenter kept one hand on the manually operated key. The word 'Here' was the signal to make one rapid depression of the key which in turn made a single mark on the recording paper. The word 'OK' was the signal to make two rapid depressions of the key which resulted in two subsequent markings on the recording paper. Whenever stuttering or 'faked' stuttering was judged to occur, the key was depressed and remained depressed for its duration.

Jaw Movements. Both experimental groups were asked to perform specific jaw movements in the absence of speech. These movements were carried out in accordance with specific instructions and practice. The particular movements employed were determined by preliminary investigation of jaw movements observed during stuttering.

The jaw movements, represented by the abbreviations JM-1, JM-2, etc., were obtained by instructing the subject as follows:

JM-1: Tense the jaw muscles and open and close the jaw. Do this six times.

JM-2: With the lips closed, teeth slightly apart, tense the jaw muscles and move the jaw to the right and back to the midline. Do this six times.

JM-3: Duplicate JM-2, except move the jaw to the left.

JM-4: Make a right-to-left circular movement with the mandible in the following way: Begin with the mouth shut, teeth resting lightly together. Move the jaw to the extreme right; open the mouth by lowering the jaw; move the jaw to the extreme left; close the mouth; move the jaw back to the midline. Do this six times.

JM-5: Duplicate JM-4 except make a left-to-right circular movement with the mandible. Do this six times.

JM-6: With the lips closed, lower the mandible as far as possible without forcing. Force air against the lips as if attempting a *p* sound, even to puffing the cheeks, and move ('swing') the jaw from side to side. Do this six times for approximately three seconds each time.

JM-7: Hold the end of a tongue depressor rather loosely between the teeth by protruding the jaw slightly and without the use of the lips; then wiggle the depressor up and down. Do this six times for approximately three seconds each time.

JM-8: Duplicate JM-7, but in addition to moving the depressor up and down, move the jaw from side to side. Do this six times for approximately three seconds each time.

Each subject was instructed to assume physiological rest between trials of each jaw movement sequence. This resulted in a 'quieting down' of the action potentials between trials. The hand key was depressed at the beginning of each jaw movement and remained depressed for the duration of that movement.

[3]Physiological rest was approximated by instructing the subject to relax the jaw with the teeth slightly apart. With these instructions there was sufficient relaxation, and consequently action potential reduction, between words for the purposes of the present study.

Analysis of data. The speech sample was obtained by requesting the subject to speak words presented on cards one at a time; hence, the sample unit consisted of one spoken word.

The EMG records for each sample unit were examined for factors which approximate, as closely as possible, the 'abnormalities' reported in stutterers' EMG records in the research cited. Thus, comparisons were made with respect to:

1. Bilateral differences in amplitude of the action potentials during the speaking of each word.
2. Bilateral differences in the instant of appearance of the action potentials for each word.
3. Presence or absence of spikes.
4. Presence or absence of reversals of amplitude differences (the greater amplitude appearing on the left side, then the right, then the left, etc.) during each unit.

Bilateral amplitude differences. The action potential records compared bilaterally were considered different in amplitude if one side differed from the other side 25 per cent or more. The difference in amplitude had to persist for two or more waves before is was considered as an amplitude difference. Moreover, this amplitude difference had to remain consistently unilateral, i.e., without reversals, *vide infra.*

Instant of appearance. 'Instant of appearance' is defined as the point on the record at which the amplitude response increased 50 percent or more over the resting level. The measurements were obtained during the time when the subject was proceeding from rest into the speech attempt. A measurement was made of the difference in time of the instant of appearance between the left and right action potentials. They were considered different if separated by more than 1/120 of a second.

Spiking. Spiking was considered present when the amplitude, represented by a single spike, was over 100 percent larger then the amplitude of waves directly preceding and succeeding it. In addition, it was required that the sudden increase in amplitude be separated from a similar occurrence by at least one-twentieth of a second.

Reversals. In the instance where bilateral amplitude differences existed between homologously paired electrodes, it is apparent that the amplitude on one side was larger or smaller than on the other side. Thus, the term 'reversals' refers to the instances where this 'larger or smaller' relationship alternated from L-R-L, etc., during the production of a single word.

Results

Statistical procedure. In view of the many comparisons requiring statistical testing, an analysis of variance design appeared to be especially well suited for this purpose. However, the use of this type of design could not be justified. An assumption of homogeneity of variance is necessary in any analysis of variance design. In the present instance there was a marked lack of homogeneity of variance from one condition to another. Instead, therefore, *t*-tests were used for the purpose of evaluating the significance of the differences investigated in this study.

The *t*-test is applied successively to each of a number of possible differences between pairs of means from a set of means for various combinations of groups and conditions. Significant results with such a procedure are to be interpreted with caution. The risk of rejecting a true null hypothesis for the largest difference is greater than

indicated by the probability given in the *t*-table. Thus, not much importance can be attached to a few scattered significant differences. Since very few significant differences were obtained, interpretation of the data presents no serious problem.

Electrode placement. Two pairs of electrodes were placed on both the left and right jaws, presumably over the left and right masseter muscles. Data are presented for each of the two bilateral pairs of electrodes, designated L_1R_1 and L_2R_2, referring to the posterior bilateral pair and to the anterior bilateral pair, respectively. Any discrepancy in results between electrode pairs indicates the effect of electrode placement on the obtained EMG.

Bilateral amplitude differences. Each electromyogram was examined for each of the two electrode placements to determine (1) the number of words per subject for which the action potential amplitude was bilaterally equal, (2) the number of words per subject for which the action potential amplitude of the left jaw was larger than that of the right, and (3) the number of words per subject for which the action potential amplitude of the right jaw was larger than that of the left. Comparisons on each of the three measures were then made between stutterers during stuttering and non-stutterers during non-stuttering, stutterers during stuttering and stutterers during non-stuttering, stutterers during non-stuttering and non-stutterers during non-stuttering, and stutterers during stuttering and non-stutterers during faked stuttering.

Only one significant difference was obtained: the difference, with one electrode setting, but not the other, between stutterers during stuttering and non-stutterers during faking for the mean number of words on which the action potential was larger from the right jaw. For this comparison the stutterers showed the most anomalies. The implications of this result, however, are extremely limited in view of the fact that no significant differences were obtained from any of the other seven comparisons involving the same measure, particularly from that of stutterers during stuttering and non-stutterers during non-stuttering speech.[4]

It should be noted that the action potential amplitude was bilaterally equal for an average of less than one word per subject for both stutterers and non-stutterers. This means, of course, that for most words spoken by both groups there was a bilateral amplitude difference.

Instant of appearance. No significant results were obtained from the analysis of the data on instant of appearance. Comparisons were made between the same conditions and groups as were made for bilateral amplitude differences.[5] Here, as with the bilateral amplitude differences, the average number of words per subject having equal bilateral instants of appearance was extremely small. In all cases, it averaged less than 0.5 words per subject.

Spiking. The results of the analysis of the data for the occurrence of spiking are shown in Table 1. The same

[4]In view of the fact that only one significant difference was obtained from these comparisons, and that one of questionable importance, it was not deemed necessary to include three rather lengthy tables. For those who are interested, the pertinent tables can be found in the original dissertation filed in the library of the University of Iowa.

[5]Again, as with the bilateral amplitude differences, the tables of data are not included. See the previous footnote.

TABLE 1. Differences between conditions with respect to the mean number of words per subject for which spiking occurred. S:NS = Stutterers during non-stuttering; S:S = Stutterers during stuttering; $S:S_1$ = Stutterers during an easy, relaxed pattern of stuttering; NS:NS = Non-stutterers during non-stuttering; and NS:FS = Non-stutterers during faked stuttering.

Elect. Pair	*Group and Condition*	*Mean*	*S. D.*	*Mean Diff.*	*S. E. Diff.*	*t*	*Signif. Level*
L_1R_1	S:S	7.07	2.39				
	NS:NS	4.13	2.79	2.94	.98	3.000	.01
L_2R_2	S:S	7.50	2.10				
	NS:NS	5.53	2.72	1.97	.94	2.096	.05
L_1R_1	S:S	7.07	2.39				
	S:NS	4.60	2.58	2.47	.52	4.750*	.01
L_2R_2	S:S	7.50	2.10				
	S:NS	5.43	2.00	2.07	.43	4.814*	.01
L_1R_1	S:NS	4.60	2.58				
	NS:NS	4.13	2.79	.47	1.02	.461	NS
L_2R_2	S:NS	5.43	2.00				
	NS:NS	5.53	2.72	−.10	.91	.110	NS
L_1R_1	S:S	7.07	2.39				
	NS:FS	9.47	.72	−2.40	.66	3.582†	.01
L_2R_2	S:S	7.50	2.10				
	NS:FS	9.53	.69	−2.03	.61	3.328†	.01
L_1R_1	$S:S_1$	5.00	2.80				
	NS:NS	4.13	2.79	.87	1.13	.770	NS
L_2R_2	$S:S_1$	4.99	2.60				
	NS:NS	5.53	2.72	−.54	1.07	.505	NS
L_1R_1	S:S	7.92‡	2.39				
	$S:S_1$	5.00	2.80	2.92	1.00	2.920*	.02
L_2R_2	S:S	8.00‡	2.10				
	$S:S_1$	4.99	2.60	3.01	.79	3.815*	.01

*t based on related measures.

† Cochran and Cox Approximation Test was used because of lack of homogeneous variance.

‡ Based on an N of 12 instead of an N of 15.

comparisons were made as for differences in amplitude and instant of appearance with the following additions: stutterers speaking with an instructed stuttering pattern of easy repetitions[6] were compared both with stutterers during stuttering and with non-stutterers during non-stuttering.

[6]The means for this condition were based on six spoken words per subject instead of the ten spoken words used for all other conditions.

Spiking occurred on significantly more words spoken by stutterers during stuttering than on words spoken by either non-stutterers or stutterers during non-stuttered speech. However, when the non-stutterers imitated or 'faked' stuttering, and thereby modified their habitual patterns of jaw movement, tension, etc., during speech, spiking occurred on

TABLE 2. Differences between conditions with respect to the mean number of words per subject for which there were reversals of action potential amplitude differences. S:NS = Stutterers during non-stuttering; S:S = Stutterers during stuttering; S:S_1 = Stutterers during an easy, relaxed pattern of stuttering; NS:NS = Non-stutterers during non-stuttering; and NS:FS = Non-stutterers during faked stuttering.

Elect. Pair	*Group and Condition*	*Mean*	*S. D.*	*Mean Diff.*	*S.E. Diff.*	*t*	*Signif. Level*
L_1R_1	S:S	2.00	1.10				
	NS:NS	.73	.89	1.27	.38	3.342	.01
L_2R_2	S:S	2.00	1.46				
	NS:NS	1.07	.95	.93	.47	1.978	NS
L_1R_1	S:S	2.00	1.10				
	S:NS	1.60	1.40	.40	.43	.930*	NS
L_2R_2	S:S	2.00	1.46				
	S:NS	2.00	1.41	.00	—	——	NS
L_1R_1	S:NS	1.60	1.40				
	NS:NS	.73	.89	.87	.45	1.933	NS
L_2R_2	S:NS	2.00	1.41				
	NS:NS	1.07	.95	.93	.46	2.022	NS
L_1R_1	S:S	2.00	1.10				
	NS:FS	3.60	2.15	−1.60	.65	2.461†	.05
L_2R_2	S:S	2.00	1.46				
	NS:FS	3.87	2.31	−1.87	.75	2.493	.02
L_1R_1	S:S_1	.84	1.06				
	NS:NS	.73	.89	.11	.39	.282	NS
L_2R_2	S:S_1	1.39	1.31				
	NS:NS	1.07	.95	.32	.45	.711	NS
L_1R_1	S:S	2.42‡	1.10				
	S:S_1	.84	1.06	1.58	.65	2.431*	.05
L_2R_2	S:S	2.25‡	1.46				
	S:S_1	1.39	1.31	.94	.45	2.088*	NS

*t based on related measures.

†Cochran and Cox Apppoximation Test was used because of lack of homogeneous variance.

‡Based on an N of 12 instead of N of 15.

significantly more words than it did during even the stuttered speech of stutterers. In contrast, when stutterers modified their stuttering pattern to one of easy, relaxed repetitions of the first syllable of the word, the mean number of words exhibiting spikes decreased to a level not significantly different from the mean of non-stutterers during normal speech. Thus, it may be concluded that the occurrence of spiking in the action potential record can be varied by modifying the manner of speaking. This fact is to be considered in evaluating the question of a physiological basis for the finding that more spiking occurred during the stuttered speech of stutterers than during the normal speech of both stutterers and non-stutterers.

Reversals. Table 2 contains data pertaining to the occurrence of left-right-left, etc., reversals of amplitude differences in masseter muscle action potentials. The comparisons of group and condition combinations are the same as those for spiking.

The results provide implications that are similar to those concerning spiking. In evaluating the data on reversals, however, there is the problem of electrode placement. The results from only one electrode placement, L_1R_1, indicate (1) significantly more reversals for stutterers during stuttering (S:S) than for non-stutterers during non-stuttering (NS:NS), and (2) significantly more reversals for stutterers during stuttering (S:S) than for stutterers during the use of a relaxed, repetitious stuttering pattern (S:S_1). The discrepancy in results between electrode placements is not a critical problem in this instance, however. Assuming that electrode placement L_1R_1 is the more reliable measure and, hence, that there is a real difference between S:S and NS:NS, this difference loses any neurological importance when the other comparisons for L_1R_1 are considered. There are more words showing reversals for NS:FS (non-stutterers during faked stuttering) than for S:S, and there are more for S:S than for S:S_1 (stutterers during the use of a relaxed, repetitous stuttering pattern). Moreover, there is no significant difference in the mean number between conditions S:S_1 and NS:NS. If electrode placement L_2R_2 is considered the more reliable measure, the only significant difference between means is that between S:S and NS:FS, the latter condition having more words showing reversals. For both electrode placements, then, the results again point to a crucial effect of the manner of speaking on the action potential response so far as the specific differences between stutterers and non-stutterers are concerned.

Jaw movements. The sample unit for jaw movement-1 through jaw movement-5 consisted of a single jaw movement sequence; for jaw movement-6 through jaw movement-8 the sample unit included continuous repetitions of a jaw movement sequence for a certain duration of time.[7] Hence, separate treatment of the results was required.

Table 3 shows the results of JM-1 through JM-5 for stutterers and non-stutterers, respectively. This table contains the percentages of jaw movements that showed: bilateral amplitude differences (amplitude from the left jaw greater, right jaw greater, or bilateral equality); bilateral differences

[7] See the section on procedure for a description of each jaw movement sequence. Henceforth, in this discussion, jaw movements 1 through 8 will be referred to as JM-1, JM-2, etc.

TABLE 3. Percentages of the jaw movements of stutterers and non-stutterers that showed each of four specified action potential anomalies for each of five different patterns of jaw movements. *Horizontally:* A=Bilateral amplitude difference; I.A. = Bilateral instant of appearance; S = Spikes; and R = Reversals of amplitude differences. *Vertically;* L_1R_1, L_2R_2 =Electrode placement 1 and 2; JM = Jaw movement set; L = Left jaw; R = Right jaw; and S = Same (bilaterally equal).

		(L_1R_1)				(L_2R_2)		
	A	*I.A.*	*S*	*R*	*A*	*I.A.*	*S*	*R*
				Stutterers				
JM-1	L 44 R 33 S 07	L 57 R 39 S 04	50	16	L 41 R 38 S 05	L 51 R 44 S 04	58	16
JM-2	L 22 R 68 S 00	L 28 R 72 S 00	64	10	L 13 R 77 S 01	L 20 R 80 S 00	64	09
JM-3	L 92 R 02 S 00	L 82 R 18 S 00	70	06	L 91 R 02 S 00	L 84 R 16 S 00	68	07
JM-4	L 13 R 01 S 00	L 38 R 62 S 00	94	86	L 13 R 01 S 00	L 35 R 65 S 00	94	86
JM-5	L 10 R 01 S 00	L 74 R 26 S 00	87	89	L 07 R 04 S 00	L 74 R 26 S 00	87	89
				Non-Stutterers				
JM-1	L 41 R 33 S 04	L 55 R 43 S 02	80	21	L 45 R 29 S 03	L 53 R 43 S 04	81	23
JM-2	L 26 R 72 S 00	L 24 R 76 S 00	77	02	L 24 R 73 S 00	L 25 R 77 S 00	76	03
JM-3	L 86 R 10 S 00	L 78 R 22 S 00	79	04	L 92 R 03 S 00	L 83 R 17 S 00	84	04
JM-4	L 06 R 00 S 00	L 40 R 60 S 00	98	94	L 09 R 00 S 00	L 33 R 66 S 01	98	91
JM-5	L 07 R 01 S 00	L 71 R 29 S 00	91	92	L 07 R 01 S 00	L 73 R 25 S 02	93	91

in instant of appearance (action potentials from the left jaw preceding those from the right jaw preceding those from the left, or bilateral simultaneity); spikes; and, reversals of amplitude differences.

An examination of the data made it fairly certain that there were no real differences between stutterers and non-stutterers for the various anomalies in each jaw movement sequence. However, *t*-tests were applied to all

resultant mean differences among the relevant comparisons for electrode placement L_1R_1. Only one of the *t*-test results was significant; the non-stutterers exhibited more spiking than did the stutterers during JM-1. This one significant result out of 40 comparisons cannot be considered important from a statistical point of view.

JM-1 was included in the series of jaw movements in order to provide a frame of reference for studying the effect of modification of jaw movement on the action potential response. It consisted of tensing the jaw muscles as the jaw was lowered and raised.

The results from JM-1, alone, clearly demonstrate that action potential anomalies occur frequently in jaw movement patterns that have no accompanying speech. A sample EMG record obtained during each of the eight jaw movements (JM-1, JM-2, etc.) is shown in Figure 1.

The results for JM-2 through JM-5 also show the same high percentage of anomalies. For these jaw movements, however, it is important to examine the kinds of anomalies that occur with changes in the jaw movement pattern. Here the assumption is made that if each kind of anomaly can be produced by following specific instructions, and be made to vary in frequency by specific changes in jaw movement alone, then jaw movement is to be considered a crucial variable in evaluating the corresponding EMG differences between the stuttered speech of stutterers and the non-stuttered speech of non-stutterers.

When the jaw was moved consistently in one direction, either to the right or to the left as in JM-2 and JM-3, there was a considerable change in the EMG record. Movement to the right (JM-2) caused a marked increase in the percentage of times the amplitude for the right jaw was larger than that for the left, and also, in the percentage of times the instant of appearance in the right jaw preceded that in the left. Movement of the jaw to the left reversed the direction of these differences. Here, the action potentials of the left jaw more often showed the larger amplitude and more often appeared first on the record.

Reversals of amplitude differences occurred in 16 to 21 per cent of the jaw movements in JM-1. This percentage increased to approximately 90 per cent for JM-4 and JM-5. The jaw movement consisted of a right-to-left circular movement for JM-4 and a left-to-right circular movement for JM-5. They demonstrate the fact that the direction of the reversal is also consistent with the movement of the jaw. When the jaw was moved from right-to-left (JM-4), the larger bilateral amplitude began on the right side and then shifted to the left side. That is, the larger bilateral amplitude changed when the direction of the jaw changed. This same relation is observed for JM-5; however, as would be predicted, the direction of the shift is from left-to-right.

In JM-6, the subject performed a continuous right-left-right, etc., movement of the jaw. A reversal occurred with each change in the direction of the jaw movement. This continuous reversing was the outstanding feature of JM-6. Moreover, it occurred consistently in all subjects.

The purpose of JM-7 was to produce a tremor in the jaw. The results showed that all of the subjects, after proper instructions and practice, produced short bursts of action potentials which consisted primarily of spikes.

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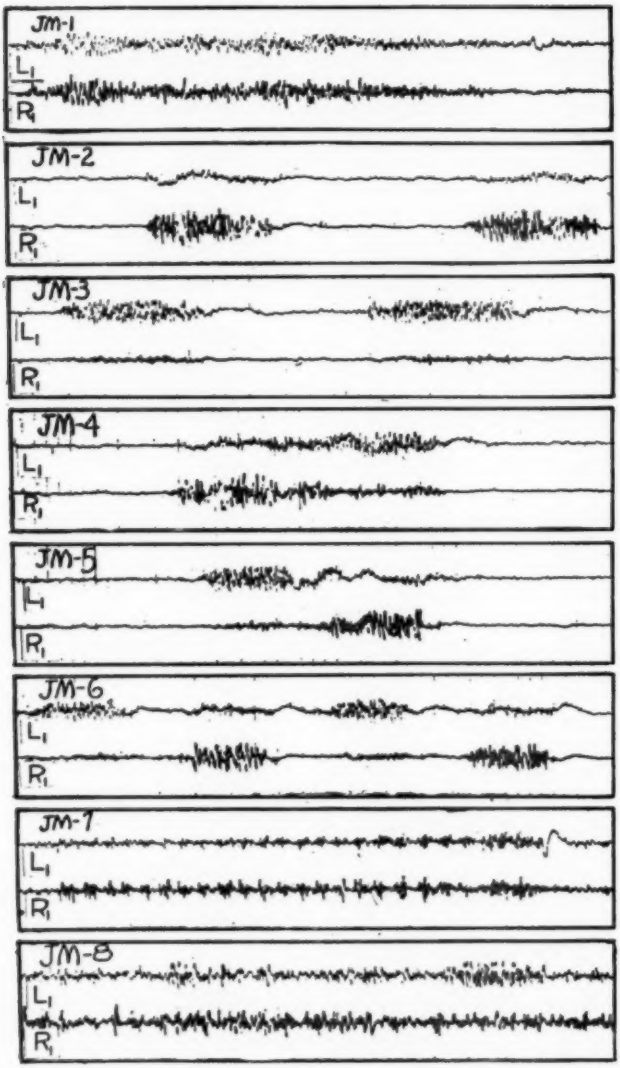

FIGURE 1. An example of the EMG record obtained during each of the instructed jaw movements. JM-1 Lowered and closed jaw; JM-2 Moved jaw to right; JM-3 Moved jaw to left; JM-4, Moved jaw from right-to-left; JM-5 Moved jaw from left-to-right; JM-6, Continuously alternating left-right-left, etc., jaw movements; JM-7, Voluntary jaw and muscle tremor; JM-8 jaw and muscle tremor plus alternating left-right-left, etc., jaw movement.

A review of Table 3 indicates that the records for JM-1 through JM-5 contained spiking in a high percentage of jaw movements. However, the EMG records for JM-7, an example of which is shown in Figure 1, show that spiking was obtained throughout this entire jaw movement series from all subjects.

In JM-8, the subjects were instructed to combine a jaw tremor with an alternating left-right-left, etc., movement of the jaw. This was done in order to determine whether the resultant EMG record was a combination of JM-6 and JM-7.

EMG record JM-8, Figure 1, shows a succession of spikes combined with reversals of amplitude differences. This corresponds, of course, to the results that would be predicted by combining JM-6 and JM-7. JM-8 was an extremely difficult task for most subjects to perform. Eleven subjects, four stutterers and seven non-stutterers, were unable to do the prescribed jaw movement. Of the 19 subjects who did the movement satisfactorily, all showed EMG records similar to those in Figure 1.

Action potentials recorded bilaterally during instructed jaw movements serve to clarify interpretation of the records obtained during speech. The jaw movement data indicate that the action potential response from the masseter muscle is, in part, a function of the manner of jaw movement. Phenomena which were considered in earlier research as differentiating stutterers from non-stutterers, i.e., bilateral amplitude differences, bilateral differences in instant of appearance, spikes, and amplitude reversals, can be reproduced in a non-speech situation by instructed movements of the jaw. JM-2 and JM-3 produced bilateral differences in amplitude and instant of appearance corresponding to the directions of jaw movement; JM-4, JM-5, and JM-6 produced reversals of amplitude differences corresponding to the direction of jaw movement; JM-7 showed continuous spiking; and JM-8 showed continuous spiking combined with reversals of amplitude differences.

Summary and Conclusions

A review of the literature on electromyography indicates that muscle action potentials represent electrical abstractions of the overt muscle response. Travis studied these muscle action potentials from paired muscles (masseter) in stutterers and non-stutterers. He found more anomalies during stuttering than during the normal speech of either stutterers or non-stutterers. Travis and Van Riper have argued that these findings represent a basic neurophysiological difference between stutterers and non-stutterers.

The findings from the present study differ from those reported by previous investigators in that no significant differences between stutterers and non-stutterers were found, under the speaking conditions employed, with regard to differences in bilateral amplitude and in the instant of appearance of action potentials between the two sides of the jaw. On the other hand, significant differences between the two groups were found with respect to incidence of spiking and of reversals of amplitude differences. However, the results of this study have shown that (1) stutterers during stuttering can be equated, by means of specified instruction, to both stutterers and non-stutterers during non-stuttering speech, (2) non-stutterers during faked stuttering were as anomalous in action potential records as stutterers

during stuttering, and (3) specific anomalies can be produced by means of specific jaw movements by both stutterers and non-stutterers.

The results thus provide no evidence to support the proposition that stutterers and non-stutterers are 'basically,' i.e., neurophysiologically, different from one another. The fact that stuttering and non-stuttering speech show certain action potential differences indicates that moments of stuttering characteristically involve muscular tension in excess of that characteristic of normal speech, and patterns of jaw movement at variance with those usually involved in non-stuttered speech.

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The Use Of Questions To Elicit Stuttering Adaptation

Robert A. Schaef

In a recent and apparently fruitful attempt to consider stuttering phenomena within a behavior or learning theory framework, Wischner (7) defines stuttering adaptation as the '... progressive decrease in frequency of stuttering with repeated readings of the same material under constant stimulating conditions.' Since this paper does not deal with reading passages, yet is intimately concerned with stuttering adaptation, this concept is here redefined more broadly as *the reduction of the frequency of the stuttering response with repeated, or continued, elicitation of verbal behavior under constant stimulus conditions.* This definition is also more consonant with the fact that a reduction of the amount of stuttering, apparently similar to adaptation, occurs from one paragraph to the next within a single long passage. (*1, 3*)

When repeated or continued elicitation of verbal behavior on the part of the stutterer is considered the essential condition for stuttering adaptation, the stimuli present in such a speaking situation fall into two classes: (1) those which are used to elicit the verbal behavior, e.g., a reading passage, a given topic on which to extemporize, the statements or questions of the experimenter in conversation, etc., herein referred to as *primary stimuli;* and (2) all other external stimuli relevant to the speaking situation, e.g., the audience, the purely physical characteristics of the room, a telephone or microphone into which the subject speaks, etc., herein referred to as *secondary stimuli.*

In most studies (e.g., 2,7) of stuttering adaptation, the primary stimulus has been a reading passage. The procedure has usually been as follows: The subject reads a standard passage aloud several times, each reading designated as a trial. The experimenter, using a separate copy of the passage for each reading, records the words on which the subject stutters. For plotting the results, either the absolute number of blocks or the percentage of stuttered words is used for the ordinate and the trial is used for the abscissa. The curve thus generated is generally negatively accelerated or falling.

In the present study the primary stimulus was a set of 14 questions designed to elicit approximately 100 words. The purpose of using questions was twofold: (1) in order to more nearly approximate free conversation (Admittedly, it is only the verbal interchange and not the continously changing content of free speech which is involved here.); and

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(2) in order to provide a less artificial situation for the subject. This latter would be especially pertinent in studies in which certain secondary stimuli, as for example a telephone, were to be used.

Procedure

The subjects were 12 adult stutterers (11 male and one female) ranging in age from 16 to 30 years. Their names were on file at the Speech Clinic of the Psychology Department or the Speech Department of the University of Pittsburgh as being in need of remedial speech work.

The primary stimulus in this study was a set of 14 questions. The questions were:

What is your full name?
What city is this?
What is the name of the season in which snow falls?
How old are you?
From what are shoes usually made?
What is the color of the sky on a clear day?
In what year were you born?
Who is the present president of the United States?
What is your favorite outdoor sport?
What is this building called?
What day is today?
What does a tailor use to cut cloth?
What is your father's full name?
What floor are we on?

These were designed to elicit approximately 100 words; the range was 98 to 106, and the mean was 102.4.

The questions were read aloud by the experimenter, and the subject replied using the stem of the question in his answer. Answering the set of 14 questions once constituted a trial. Each subject was given six consecutive trials with minimal time between each one.

All trials were carried out in the same well-lighted office with the questioner (the experimenter) sitting at the desk and the subject sitting to the side. The experimenter recorded each stuttering block on a check sheet using a lap board. He also manipulated a key which activated a cumulative timer on the desk. The latency measurements (time between the last sound in the question and first sound in the answer) thus taken have no immediate bearing on the results of this study other than that the operation of recording them was part of the secondary stimuli.

Before the experiment proper, a self-consistency check on the experimenter was conducted in the following manner: A random selection of the recorded trials of four stutterers used in a pilot study[1] was re-recorded on part of a single tape. To this was added partial readings of 'Arthur the Young Rat' by 16 different stutterers. This latter section was added to measure the experimenter's ability to accurately identify and record many different kinds of stuttering blocks, since in the main study he would be faced with the same problem. It was found during the pilot study that the experimenter rapidly obtained 100 per cent accuracy in listening to speech samples of four stutterers on succeeding days. The final tape ran about 30 minutes and contained approximately 1,200 words, which is twice the number of words spoken by the subject in any one six-trial sitting.

The experimenter listened to this tape three times, spaced two weeks apart. Each word stuttered was in-

[1]An interesting side result of this pilot study was that when a different random order of the questions was used for each trial, adaptation occurred at a slower rate.

TABLE 1. Frequency of stuttering for 12 subjects for six consecutive trials using the question-and-answer technique.

Subject	Trials 1	2	3	4	5	6
1	22	14	10	8	10	5
2	36	27	29	29	32	26
3	9	8	5	6	4	3
4	44	30	27	23	25	26
5	25	17	19	19	11	11
6	6	3	3	0	1	0
7	12	6	3	5	2	2
8	36	19	14	7	7	4
9	32	27	23	24	22	20
10	5	3	3	1	2	1
11	5	3	2	2	2	1
12	5	2	2	1	1	0
Total	237	159	140	125	119	99
Mean	19.75	13.25	11.67	10.42	9.92	8.25

dicated on a mimeographed check sheet. Phi coefficients were computed for reliability between the first and second days, the second and third days, and the first and third days. The values were respectively: .90, .85, and .91.

Results

Table 1 contains the raw data on frequency of stuttering for all subjects for the six trials. In reading across the bottom row labeled 'mean' it is apparent that successive trials elicited less stuttering. When these means are plotted on the same axes along with those which Maddox (*4*), Shulman (*6*), and Wischner (7) obtained using a reading passage, the similarity of the curves can be noted.

The difference between the mean of trial one and the mean of trial six is 11.51. This difference yields a *t* of 4.89 which is well beyond the tabled *t* of 3.11 required for significance at the .01 per cent level (11 degrees of freedom). Thus the decrement of stuttering appears to be statistically significant.

Discussion

In comparing the mean amount of stuttering obtained in the first trial with the mean amount of stuttering obtained in the last trial, statistical significance beyond the .01 level was reached. It is clear that the question-and-answer technique yields measurable stuttering adaptation comparable with adaptation obtained by other investigators utilizing reading passages. Casual graphic inspection reveals that the slope and general form of the curve obtained in this study is also similar to reading-passage adaptation curves.

The finding that repeated questions elicit significantly decreasing amounts of stuttering expands our basic knowledge of the adaptation phenomenon by adding another method, or tool, in the form of a primary stimulus, by which it can be illustrated. The value of this method is that the adaptation

is obtained in a situation more nearly approximating the verbal interchange of free speech than the reading passage used heretofore. To some extent then, the assumption that reading-passage adaptation is similar in nature to clinically observed conversation adaptation, is given support. The question-and-answer technique also provides for less artificial participation of the experimenter in the experimental situation. This is especially true where certain secondary stimuli are to be used.

However, the continuously changing content of free speech has yet to be dealt with experimentally.[2] Technically speaking, this changing aspect of speech should be explored before the similarity of the clinical and the experimental phenomenon of adaptation can be assumed. The standardization necessary for group study would appear to make this exploration difficult, yet it seems to be a logical next step. The results obtained in this study utilizing a question-and-answer technique as a primary stimulus would appear to make it a shorter one.

Summary

Twelve adult stutterers were asked a series of 14 questions designed to elicit approximately 100 words, six times in succession at one sitting. Each set of 14 answers was designated as one trial. The experimenter recorded words stuttered on a mimeographed check sheet, a procedure in which he was adequately reliable. The mean frequency of stuttering was seen to decrease on successive trials in a manner similar to that obtained by other writers utilizing reading passages instead of questions and answers. The difference between the mean frequency of stuttering for trial one and trial six was statistically significant beyond the .01 level.

[2]Since this study was made, Newman's (5) study has been published. He found that in 'self-formulated speech' (descriptions of a set of simple sketches) adaptation of the stuttering response, while it did not start until the third trial, is similar to the same phenomena observed in those studies utilizing reading passages.

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Assessing Nasal Quality In Cleft Palate Speech Of Children

Duane C. Spriestersbach

Clinicians frequently report that one of the most difficult tasks encountered in the diagnostic evaluation of cleft palate speech is that of making judgments of nasality which are not influenced by other speech deviations so frequently encountered in such speech. These deviations may include the 'typical' articulation errors of cleft palate speech such as the nasalization of fricatives and the slighting of plosive sounds. They may also include pitch patterns which detract from the general effectiveness of the speech. If several deviations are present to a significant degree, the clinician may judge the speech to be generally defective. However, if he does, he apparently experiences difficulty in fractioning the speech and in judging the contribution which each of the several factors makes to the overall defectiveness.

Sherman (*1*), using speech samples of adults with clinically-diagnosed nasal voices, has demonstrated that valid and reliable judgments of the degree of severity of perceived nasality can be made by employing the backward playing of speech samples, i.e., by reversing the magnetic tapes. Since the backward playing of speech samples prevents the recognition of individual speech sounds and speech patterns and yet does not affect the perception of the voice quality, it would appear that such a technique might be particularly useful in making judgments of the severity of nasality of cleft palate speech samples.

The purpose of the present study was twofold: (1) to demonstrate the usefulness of the backward presentation of speech samples as a diagnostic technique, and (2) to determine whether or not the articulatory defects and speech patterns found in cleft palate speech do influence nasality judgments.

Procedure

Samples of the speech of 50 children with cleft palate speech were obtained from a variety of sources in Iowa, Illinois, and Wisconsin. The only restriction made in the selection of the samples was that the speakers must not have undergone voice change. The samples represented a wide range of defectiveness of articulation and degree of severity of nasality. The samples consisted variously of nursery rhymes, counting, reading, story telling, and conversation.

The samples had been recorded on discs and magnetic tapes; a variety of types of recording equipment had been used. In order to facilitate editing, the disc recordings were rerecorded on tapes. Speech samples, 30 seconds in length, were then edited from each of the experimental tapes. These samples were arranged in a

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random order and played at 7.5 inches per second. Playback equipment included a Magnecorder, Model PT-6, followed by a power amplifier driving a three-way Jensen high-quality speaker system.[1] The samples were rated in a sound-treated room.

Forty upperclassmen and graduate students in speech pathology and audiology courses (Group A) judged the nasality of the speech samples played backward and the effectiveness of pitch variation of the samples played forward. A different group of thirty-eight upperclassmen and graduate students in speech pathology and audiology courses (Group B) judged the nasality of the samples played forward and the defectiveness of the articulation of the samples played forward. Each group rated the samples three different times. At least 24 hours separated each judging session for each group. The judgment schedule for Group A was as follows: Session 1—judgment of nasality, samples played backward; Session 2—judgment of nasality, samples played backward; and Session 3—judgment of effectiveness of pitch variation, samples played forward. The judgment schedule for Group B was as follows: Session 1—judgment of nasality, samples played forward; Session 2—judgment of nasality, samples played forward; and Session 3—judgment of defectiveness of articulation, samples played forward.

Before making the judgments required in Sessions 1 and 2, each group of judges listened to six tape-recorded samples of nasal speech previously scaled by Sherman (*1*) which represented various levels of severity of nasality. The six samples were presented to the judges forward or backward depending upon the type of presentation of the speech samples they were being asked to judge. For all three sessions each group of judges was asked to make preliminary practice ratings. For this purpose 20 of the 50 samples were selected by three experienced judges as being well-distributed within the ranges of severity of nasality, defectiveness of articulation, and effectiveness of pitch variation, respectively.

The 50 samples were rated by the method of equal-appearing intervals on a seven-point scale. In the case of the nasality judgments, the scale extended from *one*, representing least severe nasality, to *seven*, representing most severe nasality. In the case of defectiveness of articulation the scale extended from *one*, representing least defective articulation, to *seven*, representing most defective articulation. In the case of effectiveness of pitch variation the scale extended from *one*, representing least effective use of pitch variation, to *seven*, representing most effective use of pitch variation.

Results

Median scale values and Q-values were computed for the 50 speech samples in the manner described by Thurstone and Chave (*2*). It will be recalled that each group of judges was asked to make judgments during Session 2 which were identical with those made in Session 1. It was felt that repetition of these judgments would provide information concerning the stability of the nasality judgments. The mean Q-values were .98 for Session 1 and .90 for Session 2 for the nasality judgments presented forward; 1.00 for Session 1 and .93 for

[1]The speaker system consisted of two 15 inch horn-loaded bass reproducers, a BF409 mid-frequency reproducer, and an RP-302 high frequency unit.

TABLE 1. Correlations between the median scale values of different aspects of 50 thirty-second samples of cleft palate speech.

Correlated Scale Values	*r*†
1. Nasality forward 1* vs nasality forward 2*	.96
2. Nasality backward 1 vs nasality backward 2	.90
3. Nasality forward 2 vs nasality backward 2	.69
4. Effectiveness of pitch variation vs defectiveness of articulation	−.55
5. Nasality forward 2 vs defectiveness of articulation	.47
6. Nasality forward 2 vs effective use of pitch variation	−.31
7. Nasality backward 2 vs defectiveness of articulation	.07
8. Nasality backward 2 vs effective use of pitch variation	−.15
9. Shift in nasality judgments (nasality backward 2 minus nasality forward 2) vs defectiveness of articulation	−.59
10. Shift in nasality judgments (nasality backward 2 minus nasality forward 2) vs effective use of pitch variation	

*The use of the numbers *1* and *2* throughout the table refer to experimental sessions 1 and 2.

†For those correlations which approached zero the following differences from zero are required for the levels of significance indicated:

$r_{.01} = .36$

$r_{.05} = .28$

Session 2 for the nasality judgments of the speech samples presented backward; .78 for the defectiveness of articulation, and .89 for the effectiveness of pitch variation.

To the extent that the size of the Q-values is a measure of reliability, the above mean Q-values are felt to represent satisfactorily stable judgments. Another indication of the reliability of the scale values obtained from the nasality judgments can be seen in Correlations 1 and 2 in Table 1. As the table indicates, the correlation between the median scale values of the ratings of severity of nasality obtained from Sessions 1 and 2 for the samples presented forward and for the samples presented backward were .96 and .90, respectively. The judgments obtained in the second sessions were used in the intercorrelations discussed below in view of the slightly reduced size of the mean Q-values of the judgments made during those sessions.

It should be noted that more than half of the judges were inexperienced, that the speech samples were not similar in content or pattern, and that some of the recordings were made under less-than-satisfactory conditions. Despite these limitations the reliability coefficients are quite satisfactory. It would appear that stable judgments can be made of the nasality of samples presented either forward or backward.

The correlation of .69 (see Correlation 3, Table 1) between the nasality judgments of the samples presented forward and the nasality judgments of the samples presented backward indicates that not quite one-half of the variance in the one set of judgments is due to factors which are common to the other set of judgments. Obvi-

ously, then, other elements not common to both types of samples are operating. The crux of this investigation is to determine whether or not it can be demonstrated that some of the non-common elements are influencing the nasality judgments.

Correlation 4 (–.55), Table 1, reveals a relationship between judgments of the effective use of pitch variation and defectiveness of articulation. The relationship may be expressed as follows: the more defective the articulation, the less effective the use of pitch variation. This relationship may be due, of course, to the contamination of the judgments of one factor by the presence of the other, or it may be because of a more basic relationship.

Correlations 5 (.47) and 6 (–.31), Table 1, reveal that judgments of nasality made of samples played *forward* are significantly related to the judgments of defectiveness of articulation and effectiveness of pitch variation. On the other hand, Correlations 7 (.07) and 8 (–.15) reveal that judgments of nasality made on samples played *backward* are not significantly related to judgments of defectiveness of articulation or effectiveness of pitch variation.

If defectiveness of articulation and effectiveness of pitch variation do affect the nasality judgments of samples presented forward, then certain predictions can be made about the nature and direction of the differences in the scale values between the nasality judgments of the samples presented forward and those of the samples presented backward. Let us assume that a large number of articulation errors and ineffective use of pitch variation characterize a given speech sample. Let us further assume that these factors contribute to the judgment of increased general defectiveness of the speech and that the nasality judgments made of this sample when the speech is presented forward will indicate a relatively severe degree of nasality. On the other hand, when the same sample is presented backward these factors will not be operating and the judgments will indicate a relatively less degree of nasality. In other words, shifts in the judgments of individual samples will be noted when the judgments of the two types of presentations are compared.

Correlations 9 (–.59) and 10 (.30), Table 1, indicate that the shifts discussed above do occur and that they are related, to a significant degree, to the judgments of defectiveness of articulation and effectiveness of pitch variation. The more defective the articulation, the greater the difference between the judgments of nasality of the samples presented forward and backward. The less effective the use of pitch variation, the greater the difference between the judgments of the nasality of the samples presented forward and backward.

The judgments of the severity of the nasality of the samples presented forward are significantly related to the judgments of the defectiveness of articulation and the effectiveness of pitch variation. The judgments of the severity of nasality of the samples presented backward are not significantly related to these aspects. It would, therefore, appear safe to assume that the judgments of the severity of nasality of the samples presented backward are the more valid judgments of nasality. The use of the judgments of nasality of the samples presented backward would appear to be the method of choice when it is important to obtain nasality judgments contaminated to a minimum

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degree by other aspects of articulation and voice.

Summary

Thirty-second samples of the speech of 50 children with cleft palate speech were obtained. Judgments were made of the severity of the nasality when the samples were presented forward and when they were presented backward. Judgments of the defectiveness of articulation and effectiveness of pitch variation were made when the samples were presented forward. Median scale values of the various judgments were correlated.

On the basis of the findings the following conclusions would appear warranted:

1. Trained judges are able to make stable judgments of the severity of nasality in cleft palate speech of children when the samples are presented either forward or backward.

2. While there is a relationship between the judgments of the severity of nasality of speech samples presented forward and those presented backward, the relationship is such that it seems clear that factors other than nasality influence such judgments.

3. Judgments of the severity of nasality when the speech samples are presented forward are related to a significant degree to defectiveness of articulation and the effectiveness of pitch variation.

4. Judgments of the severity of nasality when the speech samples are presented backward are not related to a significant degree to defectiveness of articulation or effectiveness of pitch variation.

5. Judgments of the severity of nasality of the speech samples presented backward would appear to be more valid than those made when the speech samples are presented forward.

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A Study Of Factors In The Occurrence Of Cleft Palate

Kenneth R. Lutz

Fred B. Moor

Cleft palate has attracted interest as a medical curiosity since the early days of medicine. During the past century, methods of surgical repair have been developed and numerous studies have been conducted to determine the cause of the deformity.

Assuming cleft palate to be the result of developmental arrest, investigators have endeavored to determine what factors are responsible for the production of arrest at a stage which is optimal for its development. Dorrance (*3*) and others (*4, 8*) reviewed the numerous theories which have been proposed to explain the occurrence of cleft palate. These theories proposed that the deformity might be due to heredity, maternal nutritional deficiencies, or acute or chronic disease of the mother during pregnancy.

Studies reported during the past 25 years have considered: (1) incidence, (2) relationship of sex and race, (3) type of cleft palate defect, (4) other accompanying deformities, (5) infant mortality among children with cleft palate, (6) seasonal variation in occurrence, (7) age of the mother at time of child's birth, and (8) birth order (*1, 2, 5,* 7, *10, 11, 12*).

Prior to the study made by DeVoss (*2*), the reported studies on cleft palate had been conducted in Europe, the Eastern United States, and Hawaii. DeVoss studied a number of factors in the incidence of cleft palate in San Bernardino County, California. As a result of his investigation, he proposed that other and more extensive studies be conducted in the same region.

It is the purpose of this paper to report the findings in 303 cases of cleft palate from the clinical records of the Los Angeles County General Hospital.

Materials and Methods

The data for this study were compiled from the case records of all patients with cleft palate entering the Los Angeles County General Hospital between July 1, 1936 and December 31, 1951. From these records the following information was collected: (1) the date of the patient's birth, (2) the sex of the patient, (3) the patient's race, (4) the type of cleft palate defect, (5) associated physical abnormalities, (6) whether born alive or stillborn, (7) age of the mother at the time of the patient's birth, (8) the number of children previously born to the mother, and (9) familial reoccurrence of cleft palate.

The data compiled from the case records of all cleft palate patients

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studied are referred to as the 'Cleft Palate Group.' The data compiled from the case records of those persons born in the Los Angeles County General Hospital during the period considered in this study are specifically referred to as the 'Hospital Cleft Palate Group.'

For comparisons, data comprising a control group were selected and compiled as follows: If the cleft palate child was born in the hospital, the record of the next child born in the hospital was used. If the cleft palate child was not born in the hospital but was born during the period of study, the record used was that of the first child born in the hospital after 12:00 o'clock noon on the same date.

Findings

There were 315 persons with cleft palate admitted as patients to the Los Angeles County General Hospital during the period beginning July 1, 1936 and ending December 31, 1951. The case records of 303 of these have been reviewed to compile the data for this study. The Control Group was made up of 152 cases.

The incidence of cleft palate. During the period studied, 72,107 children were born in the Los Angeles County General Hospital. Among these there were 70 children born with cleft palate, producing an incidence of one for each 1,030 births.

Racial incidence. Statistics for the accurate determination of the racial incidence of cleft palate were not available. Approximate racial percentages were estimated from an average based on the percentage of the several races in the control group and the percentage of the several races of all patients in the hospital. By this method of calculation the incidence of cleft palate among the Caucasian, Mexican, and Negro race groups was approximately 1:1,000, 1:800 and 1:1,400 respectively. Of the 70 children born in the hospital with cleft palate 29 or 41.4 percent were Caucasian, 26 or 37.1 percent were Mexican, and 12 or 17.1 percent were Negro. The remaining three were from other race groups.

TABLE 1. The monthly incidence of cleft palate.

January	14	July	18
February	12	August	13
March	12	September	10
April	10	October	10
May	12	November	14
June	14	December	11

Seasonal incidence. The monthly incidence of cleft palate is shown in Table 1. More persons with the de-

TABLE 2. Type of cleft palate defect.

Defect type	*Male*	*Female*	*Total*
Lip only:			
Right	1		1
Left	1		1
Bilateral		1	1
Palate only:			
Right	2	2	4
Left	1	1	2
Bilateral	37	37	74
Alveolar process only:			
Right			
Left	1	1	2
Bilateral			
Combination of one or more cleft defect:			
Right	13	15	28
Left	19	18	37
Bilateral	67	29	96
Undetermined	21	31	52
Non-congenital cleft	5		5
TOTAL	168	135	303

TABLE 3. Deformities associated with cleft palate.

	Hospital Cleft palate group	*Cleft palate group*	*Control group*
Caucasian	6	27	2
Mexican	8	18	2
Negro	4	5	
TOTAL	18	50	4

formity were born during the month of July than any other month; and more during the months of June, July, and August than during any other consecutive three months. The least number were born in April, September, and October.

Sex. Of the 303 cases studied, 168 (55.4 percent) were males, and 135 (44.6 percent) were females. Of the 70 patients with cleft palate born in the hospital, 36 (51.4 percent) were males and 34 (49.6 percent) were females. Among the control group 48.8 percent were males.

Type of cleft palate defect. A summary of the various types of cleft palate defect is shown in Table 2. Cleft of the lip alone occurred in only three cases (one percent) and cleft of the palate alone, in 80 cases (26.4 percent). In 74 cases (24.4 percent), the palatal cleft was bilateral. The alveolar process alone was involved in only two cases. The cleft affected more than one structure in 141 cases (47 percent). It was impossible to determine the type of defect in 52 cases, and there were five cases of noncongenital cleft palate.

There were no sexual differences in the occurrence of single cleft palate defects. There were more females exhibiting clefts of more than one structure on the right and more males showing involvement of more than one structure on the left, but the differences were slight. There were twice as many males as females with bilateral clefts involving more than one structure. Although there were nearly the same number of males and females in the Hospital Cleft Palate Group, there were nearly three times as many males as females with the bilateral cleft involving more than one structure.

Associated deformities. Associated deformities were observed in 50 of the cases of cleft palate as summarized in Table 3. Sixty-two percent of the associated defects were in females.

TABLE 4. Summary of maternal ages.

Age	*Cleft Palate Group*			*Control Group*		
	Caucasian	*Mexican*	*Negro*	*Caucasian*	*Mexican*	*Negro*
Less than 16				2		
16–20	14	7	5	12	10	10
21–25	12	8		17	21	21
26–30	5	7		7	15	15
31–35	6	7	1	4	7	1
36–	4	1		2	5	2

TABLE 5. Summary of birth order.

Birth Order	Cleft Palate Group			Control Group		
	Caucasian	Mexican	Negro	Caucasian	Mexican	Negro
1	14	6	4	15	20	17
2	18	11	2	9	11	18
3	8	6		7	11	6
4	4	2		10	6	7
5	7	2		1	3	5
6–10		4	1		6	2
11–		3				

Of the 70 patients with cleft palate born in the hospital during the period studied, 18 (25.7 percent) exhibited some associated defect. The incidence of deformity in the control group, on the other hand, was 3.9 percent.

Incidence of stillbirths. Of the 72,107 births in the hospital during the period of study, 2,206 (3.7 percent) were stillbirths. During the same period among the 70 cases of cleft palate, six (8.6 percent) were stillbirths.

Maternal age and parity. Distributions of maternal age and the order of birth are shown in Tables 4 and 5. About 60 percent of all Caucasian and Negro cases and of the Mexican Control cases were born to mothers less than 26 years of age. The ages of Mexican mothers in the Cleft Palate Group cases were distributed about evenly between 16 and 40 years.

Over 74 percent of the cases in the Cleft Palate Group and in the Control Group were the first, second, or third child born to the mother with the exception of the Mexican Cleft Palate cases. Eleven (33.6 percent) of the Mexican Cleft Palate cases were distributed about evenly from the fourth to the thirteenth child born to the mother.

Familial incidence of cleft palate. The number of instances in which cleft palate occurred more than once in the same family was determined. A familial reoccurrence of cleft palate was found in nine cases (three percent).

Discussion

Recent reports of the incidence of cleft palate in the United States have varied between one in 700 and one in 900 (*2*, *5*, 7, *10*). The incidence of cleft palate in the Los Angeles County General Hospital was lower than that previously reported. A possible factor in this tendency is the fact that a large percentage of the children born in the hospital were of Negro parentage (*1*). It was observed, however, that the incidence was lower for the Caucasian and Mexican races as well. It appears, therefore, that some factor other than race was responsible for the decreased incidence of cleft palate observed in this study.

More persons were born with cleft palate during the months of June, July, and August than any other three-month period. This corresponds with the high incidence during the summer season reported by Phair (*10*) and Worchester, Stevenson and Rice (*12*).

Cleft palate has been found to be more common among males than among females. Many of the earlier reports were based on surgical cases, and Davis (*1*) contended that probably there were a large number of female cases not reported because they were not treated surgically. Recent studies indicate that cleft palate occurs nearly twice as frequently among males as among females (*2, 5, 10*). The findings in this study show that cleft palate is more common among males than females, but not to the extent previously reported.

Among the three cases exhibiting clefts of the lip alone, two were male and one was female. Although this is too small a number to serve as a basis for any conclusion, it is interesting to note that DeVoss (*2*) observed a similar relationship.

Bilateral clefts occurred in 65 percent of the cases studied. No attempt was made to differentiate between those clefts which were bilateral for one structure and unilateral for others, and those clefts which were bilateral for all structures involved. It appears from these data that clefts are more common on the left and bilaterally than on the right, as was reported by Phair (*10*).

Other concomitant deformities have been found to occur more frequently among children with cleft palate than among normal children. Previous reports on the incidence of accompanying deformities have ranged up to 33 percent (*1, 10, 11*). Twenty-five percent of the patients with cleft palate born in the Los Angeles County General Hospital during the period of this study had some other accompanying deformity. Only 3.9 percent of the cases in the control group showed deformities.

No previous report has appeared on the incidence of stillbirths among children with cleft palate. This study would indicate that stillbirths occur twice as frequently among cleft palate cases as among normal controls.

Phair (*10*) found a relationship between the incidence of cleft palate and the mother's age and the birth order of the child. A more recent study by Palmer (*9*) indicated that there was no significant relationship between the incidence of cleft palate and the maternal age or parity. A similar conclusion is justified by the data upon which this study is based.

The familial incidence of cleft palate in the United States has been reported to be about 20 percent (*1, 10, 11*). DeVoss (*2*) and Ritchie (*11*), however, found a familial incidence of 10 percent. Among 303 cases included in this study, there were nine cases of known familial incidence, or less than three percent. Since a large proportion of the cases were hospitalized for medical or surgical treatment, it is probable that the figure of three percent is below that of the population studied. It is also possible that this factor can explain the decreased incidence observed in this study.

Summary

The case records of 303 cases of cleft palate from the files of the Los Angeles County General Hospital covering the period from July 1, 1936 to December 31, 1951 were reviewed. Statistics were computed and analyzed for a number of factors relative to the

occurrence of cleft palate. The findings were:

1. The incidence of cleft palate among the Caucasian, Mexican, and Negro race groups was approximately 1:1,000, 1:800 and 1:1,400 respectively.

2. More persons were born with cleft palate during the summer months of June, July, and August than during any other season.

3. Fifty-five percent of the cases of cleft palate were males.

4. The bilateral clefts involving the lips, alveolar process, and palate in varying combinations were most common.

5. Deformities other than cleft palate were present in 25 percent of the cases with cleft palate who were born in the hospital.

6. Stillbirths occurred twice as often among cleft palate cases as among non-cleft palate controls.

7. There was no relationship between the occurrence of cleft palate and maternal age or parity.

8. A familial reoccurrence of cleft palate was noted in slightly less than three percent of the cases included in this study.

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Social Relationships Among Speech Defective Children

Forrest Lee Brissey
William D. Trotter

It is a common observation that the exceptional child is subject, in some degree, to social attitudes of intolerant rejection. In part, such attitudes are quite irrational and appear to stem from ignorance and fear. For example, the grimaces and uncontrolled writhings of the cerebral palsied may serve to effectively conceal an active and alert intellect and lead to the unwarranted assumption that such an individual is feeble-minded or 'unbalanced.'

It must be recognized, however, that the term 'handicap' has literal significance. The high-speed, technical, and competitive society in which we live places a premium on physical fitness and self-sufficiency. And it appears that, socially considered, departures from certain usually ill-defined and vague cosmetic standards are not tolerated.

The writings of Carlson (*3*) and McKibben (*9*), both of whom are cerebral palsied, offer a documented insight into the manifold problems associated with winning social acceptance in an intolerant and uninformed society.

It is not necessary to restrict such considerations to the more severe physical handicaps. Johnson (*4*), in his autobiographical account of the early social development of a stutterer, describes the intolerant behaviors that militate against the social integration of the speech handicapped. Johnson, et. al., (*7*) deal at some length with the adjustment problems of speech defective children.

Although biographical accounts such as those referred to above, and the wealth of clinical observations available to Johnson and his group contribute to the information regarding speech defects, there seems to be a need for carefully controlled, definitive research concerning the social adjustment problems of the speech handicapped. There is surprisingly little direct evidence relevant to the significance of speech defectiveness in social development.

The importance of social intolerance has been expressed in a rather specialized form by those who adhere to a non-organic theory of the onset of stuttering. Johnson (*6*) emphasizes the role of adult intolerance of the child's normal speech non-fluency, and Bullen (*2*) attributes the non-existence of stuttering among the Bannock and Shoshone Indians of Idaho to an apparent lack of anxiety about speech fluency.

Others, employing standardized personality measures, have attempted to differentiate between speech defec-

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tives and normal controls. Wood (*13*) concluded that thirty to sixty-five per cent of a sample of children with articulatory defects revealed withdrawing tendencies, a sense of frustration, a lack of affection, and anxiety-insecurity.

Brown and Hull (*1*) studied the responses of stutterers to the Minnesota Personality Scale. They report that the section of the test having to do with social adjustment elicited responses that differed significantly from the norms.

Johnson (*5*) used the Woodworth-House Mental Hygiene Inventory in conjunction with interviews of 70 stutterers. He concluded, 'Stutterers in general are far from being psychoneurotic' and '... many of their personality problems are to be accounted for in large measure by the restraining and humiliating aspects of stuttering.' Richardson (*11*) used a battery of tests to differentiate between stutterers and non-stutterers. It was concluded that stutterers are socially more introverted, more depressed, and less happy-go-lucky, as based on responses to the Guilford Inventory of Factors S T D C R. On the basis of Rorschach test responses it was concluded that stutterers failed to respond impulsively to the outside environment.

In a recent study by Walnut (*12*), Minnesota Multiphasic Personality Inventory responses of stutterers, crippled, and cleft palate individuals were compared with normal controls. Scores for all individuals fell within the normal range. Stutterers showed slight indications of paranoid and depressive tendencies when compared with the controls.

These studies seem to warrant the general conclusion that, personality-wise, speech defectiveness tends to be associated with comparatively mild disturbance or none at all. It is reasonable to assume that where disturbances are manifested, they are intimately related to the speech problem and tend to reflect something of intolerant attitudes toward speech defectiveness.

The recently reported findings of Perrin (*10*) tend to corroborate the above assumption. A Moreno-type sociometric evaluation of children was conducted in grade school classes, and the social positions of speech defective children were compared with those of the non-speech defective. It was concluded that a greater percentage of speech defectives had lower social positions than the non-speech defectives. Further, when a similar evaluation was conducted in a speech therapy class in which only the speech defectives of the general classes were enrolled (speech defectives evaluating speech defectives), the social positions of approximately 58 per cent of the speech defectives were higher than in the general group. Approximately 21 per cent had lower positions than in the general group, and, presumably, approximately 21 per cent remained unchanged.

These findings suggest that individuals in the speech therapy group tended to employ somewhat different criteria in making sociometric judgments than the more general group, and that these criteria tend to de-emphasize speech defectiveness. The main concern with regard to the implications of speech defectiveness for adjustment must center in the attitudes of the general population toward speech defectiveness. An interesting question, however, concerns the attitudes of the speech defectives themselves with regard to speech defective persons. The present study is con-

cerned with the social patterning in a group composed of speech handicapped children.

Subjects

The subjects employed in this study were 28 boys ranging in age from 7 years 5 months to 15 years 9 months. They were enrolled in a six-weeks summer residential clinic for speech correction. A variety of defectiveness was represented, both with reference to type and to severity. The group was composed of 13 cases of stuttering, 7 cases of articulatory disorder, 5 cases of cleft palate, one case of cerebral palsy, one case of apparent speech retardation, and one case of defective hearing.

The subjects were housed in a large, family style residence with from two to six boys assigned to a room. The house was supervised by a graduate student couple and a graduate student proctor. Meals were served in a nearby university dormitory. Daily activities involved individual and group speech therapy, swimming lessons, and organized recreational activity.

Purpose

The markedly heterogeneous nature and the small size of the group available for the study precludes rigorous evaluation or meaningful generalization to any reasonable population. However, since a relatively unique opportunity was presented to observe the social patterning of a group of speech defective children, and to reveal potentially meaningful hypotheses for future research, an effort was made to suggest answers for the following questions:

1. Is the severity of the communicative handicap related to the social patterning achieved in the group?
2. Is the social patterning of the group subject to change when time is allowed for developing more intimate acquaintances? In this connection it might be assumed that if a social patterning is mainly a function of speech defectiveness, time for acquaintance would effect relatively little change.
3. To what extent is the social patterning achieved related to age?
4. To what extent is the social patterning a function of the situation for which preferences are indicated?

Procedure

At the end of the first week of the clinic, a Moreno-type sociometric evaluation of the group was conducted. Mimeographed lists of the names of the boys (arranged in alphabetical order) were passed out to each boy. There was one list for each of five choice situations on which the subject was asked to indicate his first, second, and third choice. The choice situations were as follows:

1. The boy you would most like to eat with.
2. The boy you would most like to room with.
3. The boy you would most like to take home with you on a visit.
4. The boy you would most like to have as a partner in games.
5. The boy you would most like to talk to.

Social position was determined on the basis of the total number of votes received for first, second, and third position. This procedure was repeated at the end of the fourth week of the program and again at the end of the sixth, or final, week. In addition, at the end of the sixth week, each of the subjects was interviewed with respect to his choices for the five categories. Tape recordings were made of the interview questions and responses

made to them. The majority of subjects were able to complete the choice blanks without assistance. Three of the younger subjects required the assistance of the experimenter, and neither verbal nor written responses were available from one subject; however, his name remained on the choice blanks. In addition, one of the subjects dropped out of the program at the end of the third week. Although no specific commitments were made, the subjects were informed that the information they provided would be used in dining room seating, recreational planning, etc., where possible. It was not practical, however, to utilize the information in any rigorous fashion although occasional administrative use was made of it.

In addition to this evaluation, the clinicians to whom the subjects were assigned for speech work were asked to judge the over-all communicative handicap displayed by each subject. A simple seven point scale was used with the higher scale values indicating the greater degrees of communicative handicap. Since at least two clinicians were assigned to each subject, a minimum of two independent ratings was obtained for each subject. It appears that the judgments made were reasonably reliable since 92.8 per cent of the ratings agreed exactly or were within plus or minus one scale point.

TABLE 1. Age, first, fourth, and sixth week social rank, type of speech handicap, and judged over-all communicative handicap.

Subject	*Age*	*Social Rank*			*Type of Speech Handicap*	*Mean Over-all Communicative Handicap Rating*
		1st Week	*4th Week*	*6th Week*		
W.S.	13–10	1	8	3.5	Stuttering	3.5
R.B.	11–11	2	1	2	Stuttering	3.5
P.L.	11–7	3	2.5	1	Articulation	2.0
D.D.	12–1	4.5	14	18	Hearing	2.0
D.H.	15–9	4.5	4	3.5	Cleft Palate	3.0
D.C.	13–6	6	5	3.5	Stuttering	3.5
P.M.	13–2	7	6	7.5	Stuttering	3.7
G.C.	10–6	8	9	18	Articulation	3.0
G.B.	12–6	9.5	2.5	10.5	Stuttering	7.0
R.J.	14–7	9.5	11	5.5	Stuttering	3.5
H.P.	13–11	11	14	9	Stuttering	3.5
R.B.	14–0	12	16	18	Stuttering	3.7
M.U.	10–4	13	22	25	Stuttering	4.7
P.B.	7–5	14	25	23.5	Ret. Speech	6.0
T.R.	8–4	15	26	27	Articulation	5.5
D.S.	12–6	16	19.5	15	Stuttering	5.0
P.D.	9–2	19	18	12.5	Articulation	6.5
T.H.	10–5	19	17	12.5	Cleft Palate	3.5
R.O.	10–0	19	21	20	Cleft Palate	5.0
J.S.	8–0	19	11	15	Cleft Palate	4.5
D.W.	12–7	19	23.5	15	Articulation	5.0
B.K.	9–1	22.5	14	7.5	Articulation	3.7
M.V.	7–5	22.5	23.5	21.5	Cleft Palate	5.5
R.H.	9–0	24	7	10.5	Articulation	5.5
E.K.	10–9	25	19.5	23.5	Stuttering	3.5
R.T.	11–11	26.5	11	21.5	Stuttering	3.5
C.W.	11–1	26.5	Dropped out		Stuttering	2.7
D.E.	7–5	28	27	26	Cerebral Palsy	3.7

Results and Discussion

Table 1 lists the subjects, age, social positions, judged degree of communicative handicap, and type of speech defect.

In order to determine the relationship between severity of the over-all communicative handicap and social position, a chi-square test of independence was used. This analysis was conducted for the choices made at the end of the first week, fourth week, and sixth week. The values of chi-square are 2.40, 2.98, and .83 respectively and are not significant at the five per cent level of confidence.

Although the theoretical frequencies employed in the chi-square analysis are necessarily small, there appears to be no evidence from this analysis to suggest that the number of votes received is related to the severity of the communicative handicap. If it is assumed that no such relationship exists, it could be accounted for by the fact that this group shares the common problem of speech defectiveness. They would perhaps be more likely, therefore, to be less impressed with communicative disorder and seek other characteristics upon which to base their choices.

Choices made at the end of the first week and at the end of the fourth week tend to be related since the value of the rank order correlation between the two sets was .61, which differs significantly from zero at the one per cent level of confidence.[1] A similar comparison of choices for the fourth and sixth week revealed a rank order correlation of .82, and for the first and sixth week a correlation of .61; both are significantly greater than zero at the one per cent level of confidence.

Taken at face value, these figures suggest that a period of acquaintance influenced the social patterning of the group since a greater stability of choices is indicated for the later period of residence.

It is worthwhile, perhaps, to point out that this finding suggests further support for the previous one regarding communicative handicap and social position. If choices are made mainly

[1]Where $SE = \frac{1}{\sqrt{N-1}}$ (8, p. 46-47)

TABLE 2. Rank order correlations among social ranks in five situations* at the end of the first week.[1]

	Situation			
Situation	2	3	4	5
1	.72	.81	.73	.89
2		.79	.73	.73
3			.81	.84
4				.87

*1 = Room with; 2 = Take home for a visit; 3 = Talk to; 4 = Have as a partner in games; and 5 = Eat with.

TABLE 3. Rank order correlations among social ranks in five situations* at the end of four weeks.

	Situation			
Situation	2	3	4	5
1	.71	.74	.66	.89
2		.82	.60	.66
3			.66	.63
4				.61

*1 = Room with; 2 = Take home for a visit; 3 = Talk to; 4 = Have as a partner in games; and 5 = Eat with.

TABLE 4. Rank order correlations among social ranks in five situations* at the end of the sixth week.

Situation	Situation 2	3	4	5
1	.84	.80	.83	.84
2		.73	.71	.71
3			.80	.71
4				.74

*1 = Room with; 2 = Take home for a visit; 3 = Talk to; 4 = Have as a partner in games; and 5 = Eat with.

in terms of speech defectiveness, it would be plausible to expect reasonably stable choices throughout the entire program, since speech defectiveness is a fairly obvious characteristic.

That some other factor is influential in determining social position is indicated by the magnitude of the rank order correlations between age and social position for the first, fourth, and sixth weeks. These values were, respectively, .59, .52, and .57, all of which differ significantly from zero at the one per cent level of confidence. A chi-square analysis of age vs degree of communicative handicap failed to reveal a statistically significant relationship between these variables. The value of this chi-square is 2.34 and is not significant at the five per cent level.

Although it might be expected that the choice of a boy to talk to might differ considerably from the choice of a boy to eat with for speech defective children, the rank-order intercorrelations for the five choice situations reveal that no such difference can be substantiated. Tables 2, 3, and 4 present the rank-order intercorrelations for the choices at the end of the first, fourth, and sixth weeks respectively. It is apparent that the five choice situations tend to evoke about the same choices.

The reasons given by the subjects for their choices lend further support to the view that speech defectiveness was not a major consideration in their social choices. An analysis of the responses given to the interview questions reveals that common interests, similar ages, and similar backgrounds provide the most frequent basis of choice. With regard to the choice of a boy to talk to, a category that would presumably elicit reference to speech defectiveness, there was only one case of direct reference to speech. Thus, with regard to reasons given for their choices, the subjects appeared not to be importantly influenced by speech defectiveness or its influence on communication.

Summary and Conclusions

It was the purpose of this study to determine whether the degree of communicative handicap associated with speech defectiveness tends to be associated with social position. A group of 28 speech defective boys was evaluated for social position in accordance with the general method of Moreno. The subjects were attending a six-week summer residence clinic for remedial speech work.

Although the data offer no support for the hypothesis that social position is related to the degree of communicative handicap, several points of criticism must be considered:

1. Due to the small number of subjects the findings must be regarded as only suggestive.

2. It is not clear that the judgments referred to as 'communicative handicap' are valid, since such a characteristic is obviously complex and subject to the well-known criticisms of judgment procedure. (It is interesting to note, however, that the literature reveals little effort to determine the relation of speech defectiveness to the broader problem of effective communication. Perhaps this is a point that to most workers is so obvious as to require no empirical evaluation; however, when the matter is considered in the more comprehensive frame of communication theory, the assumption seems to become less obvious.)
3. The group employed in this study may be less intolerant of speech defectiveness and, therefore, more readily employed other criteria for evaluation than would a non-defective peer group. Perrin's findings reported earlier tend to corroborate this suggestion.

Other findings that may be tentatively reported reveal a tendency for social position to be related to age, and for social position to be unstable with time. This latter may be due to the greater intimacy of acquaintance which time provides. The relation may also reflect, however, an inherent lack of stability of social patterning under these conditions.

In a recorded interview, conducted at the end of the residence program, the subjects were asked to state why they had chosen as they had. An informal analysis of the reasons given revealed little or no concern with speech defectiveness as a basis of choice or rejection.

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A Scale To Measure Parental Attitudes

John H. Wiley

Discovering the relationships between the child and his parents is frequently a challenge to the clinician. Even direct observation may be misleading, unless done for a long period of time by a skilled observer. Since time and opportunity for direct observation are limited, indirect methods must be used frequently. This study is an attempt to measure some of the parent's attitudes or tendencies toward behavior in relation to the child.

The attitude scale presented here was designed as a research and clinical tool, primarily for the speech clinician. How well the verbal expressions relate to actual behavior can be determined only by further investigation.

The Scale

There have been many studies of attitudes (*1*, *2*, *3*, *11*, *12*, *13*, *14*, *18*) and a few studies of possible personality characteristics which differentiate parents of children with speech defects (*6*, *16*, *17*), but the writer has found only a single investigation relating parental attitudes and speech problems (*18*). In the scale described here, a modification of the method of summated ratings, developed by Likert (7), was used. Eight areas were defined and described, and a total of 160 items, divided into eight subscales, were developed. For each item, five possible responses were listed: Strongly Approve; Approve; Undecided; Disapprove; Strongly Disapprove. These were scored on a one to five scale.

Twenty-three items were developed from the first area, that of general home standards in such things as neatness, freedom, and character of punishment. Test items included such statements as:

> It is unwise for parents to correct a child's behavior by saying, 'When I was a child I never did that.' Talking the problem over with the child is the best way of dealing with unsatisfactory behavior.

Twenty-six items were developed from area two, dealing with the child's verbal output. Such items were used as:

> A child should be taught by the age of three to always say, 'please,' 'thank you,' and 'excuse me' to adults. Errors in a young child's speech should be ignored by the parents.

Area three, relating to the expression of hostility in the child, included twenty items. Statements like the following were involved:

> Children should always be polite and courteous to their parents. A child should be punished for intentionally breaking things in the house.

There were twenty-one items on oral activities (weaning, feeding, and thumb sucking) in area four. These included:

> Feeding at the breast is more satisfying for a child than feeding from a bottle.

John H. Wiley (Ph.D., University of Southern California, 1950) is Director, Speech and Hearing Laboratories, University of Nebraska. This article is based on a Ph.D. dissertation completed at the University of Southern California under the direction of Dr. Lee E. Travis.

> Thumb sucking should be curbed by the use of medicine and gloves.

Toilet training, area five, included nineteen items, such as:

> Parents should develop, in their children, a feeling of pride about their ability to control their bowel movements and urination. A child should be completely toilet trained about the age of one year.

Area six dealt with attitudes toward sexual behavior and interest in children. There were 24 items in this area, including:

> It makes little difference whether children get their information about sex from their parents or other adults. Parents should try to make their children afraid of sexual relationships.

The twenty items in sub-scale seven dealt with parent's attitudes towards differences in raising boys and girls. These included:

> Ordinarily, little girls develop speech faster than little boys. Little girls should be given more care and attention than little boys.

A monograph on boy and girl differences by Schuell (*10*) was consulted before these items were constructed. In this monograph, Schuell described some of the differences between boys and girls that might affect speech development. The eighth area contained seven items on crying.

These items were intermixed in random order and mimeographed. At the top of the sheet appeared the following instructions:

> Express your honest opinion or feeling about each of the items below. Give your own opinion, even though it may not agree with what you have read in books, or heard in classrooms. There are five alternative answers to each of the items: Strongly Agree: Agree: Undecided: Disagree: Strongly Disagree. Encircle the most appropriate response for you. Answer every item.

On most of the scales, respondents were asked only to give their sex, age, marital status, and number of children. In the last three student groups tested, students were also asked their occupation (since these were summer school groups).

Several types of University student groups and parent groups were studied.

Four classes that were primarily lower division students included two sections of Voice Improvement, one section of beginning Public Speaking, and Beginning Educational Psychology.

Four classes of upper division and graduate students included two sections of Physiological Psychology, Mental Hygiene, (Education) and Guidance (Education). Students from a section of an upper division and graduate level class for clinicians titled Psychology of Speech and Hearing were studied. Later, another such class was studied at the beginning and at the end of a summer session. Scales were also presented to a number of spouses of this group at the beginning of the summer.

Parent groups studied included two groups whose children were enrolled at the University of Southern California Speech and Hearing Clinic. One section had been previously judged as requiring counselling; the other was judged as not requiring counselling at that time. Three small groups of the parents of stuttering children were studied. One group was from the Speech and Hearing Clinic; a second was from a school system where there had been some counselling; and the third was from a school system where there had been little counselling.

Two groups of parents of children with hearing losses enrolled at the Tracy Clinic were studied. The

group whose children attended during the year had received considerable counselling, while those who had attended during the summer had much less counselling.

Reliability

Reliability coefficients (using Pearson-Product Moment r, and the Pearson-Brown prophecy formula to correct for length) were run on the first 172 cases tested. Corrected reliabilities on the first seven scales were from .80 to .90, so the scales were thought to be sufficiently reliable for further investigation. Scale eight had only seven items, and so was too short for the split-half method employed.

Item Evaluation

The 'correctness' of the arbitrary values assigned to the five responses to each item was measured by using the criterion of internal consistency. The first 172 cases were studied in this evaluation, comparing the highest and lowest 10%. The maximum possible difference for each item would be four. Only one item might be thought to have been scored in the wrong direction since the difference was negative.

Relationship of Sub-Scales To Total Scale

Pearson-Product Moment r's were computed between each of the subscales and the total of the other scales. These varied from 0.52 for Scales VIII and 0.54 for Scales VII to 0.78 for Scales III. Each correlation was statistically significant, but not so high as to indicate necessarily that all scales measure the same variable.

TABLE 1. Comparison of scores on attitude scale achieved by eight student groups.

	Pub. Sp. *I*	*Voice Imp. I* *II*	*Voice Imp. II* *III*	*Phys. Psych.* *IV*	*Phys. Psych.* *V*	*Educ. Psych.* *VI*	*Ment. Hyg.* *VII*	*Guid.* *VIII*
M	440.54	445.46	422.77	403.19	397.96	438.81	428.53	428.35
	39.07	48.19	58.58	51.64	64.43	35.76	41.57	33.37
	7.52	10.51	11.72	5.47	13.15	3.97	6.83	4.67
Critical Ratio								
I	****	0.38	1.99	4.02	2.81	0.20	1.18	1.38
II		****	1.44	2.82	2.82	0.59	1.35	1.49
III			****	1.51	1.41	1.30	0.42	0.44
IV				****	0.37	5.27	2.90	3.50
V					****	2.98	2.06	2.18
VI						****	1.30	1.69
VII							****	*
VIII								****

*No critical ratio was computed for the difference between VII and VIII since the means were almost exactly alike.

Validity

Validity could not be estimated by comparison to well established tests since no comparable test existed. The main attempt to establish validity was by comparing scores on the attitude scale with 'clinical judgements' concerning the groups filling out the scale. An attempt was made to estimate the attitudes before the scale was administered. Such factors as classroom instruction on children's problems, counselling on children's problems, and clinical experience with children were regarded as favorable factors. If the scale was valid, experienced speech and psychology clinicians should achieve favorable scores.

The original group of 172 cases studied tended to bear out this hypothesis. The members of the class

TABLE 2. Comparison of the mean scores of all groups studied.

Group	*N*	*Mean*	*S.D.*
Psych. -s-2	43	245.33	53.09
Experts	21	270.10	52.14
Psych.	34	333.38	48.21
Psych.-s-1	43	339.65	58.23
Tracy Clinic-Regular Year	26	353.58	59.51
Stutterers-A	10	363.10	45.66
Tracy Clinic-Summer	19	395.16	54.98
Phys. Psych.-Summer	25	397.96	64.43
Stutterers-AI	16	402.25	41.78
Phys. Psych.	90	403.19	51.64
Parents-CII	24	407.79	48.84
Spouses-Psych.-Summer	20	408.55	55.35
V. I. I.	26	422.77	58.58
Stutterers-AII	6	427.66	44.17
Guidance	52	428.35	33.37
Ment. Hyg.	38	428.53	41.57
Educ. Psych.	82	438.81	35.76
Public Speaking	28	440.54	39.07
V. I. II	22	445.46	48.19
Parents-CI	22	448.59	43.98

in 'Psychology of Speech and Hearing' had significantly more favorable average scores than the other three classes. Differences between the other groups, while not large, were in the direction of more favorable scores for the advanced students. Later groups of students were compared to further evaluate this relationship. These scores are presented in Table 1.

Results and Discussion

Groups I, II, III, and VI were beginning classes, and the differences in means were not significant. They might be thought of as a relatively homogeneous group for the purposes of this test. Groups IV and V were two sections of the same class, and were similar in score. Groups VII and VIII were advanced groups largely composed of public school teachers and administrators. They seemed to resemble Groups I, II, III, and VI more closely than groups IV and V. Differences between VII and VIII and IV and V might be accounted for because IV and V were composed largely of potential clinicians (physicians, clinical psychologists, speech pathologists, and audiologists). Some other student and parent groups varied significantly in score from the groups presented here.

A comparison of the mean scores achieved by the different groups is given in Table 2. The most favorable score was achieved by the second testing of a summer session section of the course 'Psychology of Speech and Hearing'. This group had favorable scores even at the beginning of the class. The difference in means between the before and after testing was 94.32 points, a very significant difference.

The next most favorable scores were achieved by a group of experts (speech and psychology clinicians). The mean scores of the experts averaged 1.6 per item, between a 'favorable' and 'most favorable' response. Since this group varied somewhat in the amount of training and experience, their scores were not 'perfect' but approached an 'ideal' score.

Among the parents' groups, the most favorable scores were achieved by the parents of children enrolled in the Tracy Clinic during the regular school year. This group had had a good deal of counselling. The next group was a group of parents of stuttering children who had had a considerable amount of counselling. The next two parents' groups (averaging about two and a half points per item) were the summer group of parents at Tracy Clinic and a group of parents of stuttering children who had had some counselling. Since the speech problems of the children at Tracy Clinic were related to a physical handicap and not necessarily to any unfavorable attitudes or parent-child relationships, the attitudes of such a group might be more favorable than some other parents' groups.

The group of parents identified as Parents-CII were a group whose children were admitted for speech therapy at the University of Southern California Speech and Hearing Clinic. A similar group were designated as Parents-CI. The CI group were selected for counselling on the basis of the original interviews with the parents, while the CII group were judged as not needing counselling at the time.

A third group of parents of stuttering children who had not had counselling were listed as Stutterers-AII. These groups of parents of stut-

tering children were so small that the differences can be thought of as suggesting further investigation.

Several of the student groups were analyzed to see if there were consistent differences in scores between men and women. While there were differences in scores between men and women, in some of the groups, these differences were not consistent. The average differences between means for the total group of 210 students was 0.54 points.

Student groups were further divided as to marital and family status. Single students were compared to married students without and with children. For the ten groups studied, single students achieved significantly (5% level) higher or less favorable scores than married students. Differences between the two married groups were not significant. Differences might be attributed to greater emotional maturity, changes in other adjustment, or to greater age. An evaluation of the groups according to age produced no consistent differences. The three education classes were evaluated as to the effects of the number of years of teaching and types of teaching experience. No consistent differences were found.

A total of 647 cases were included in the study, including 483 students and 164 from non-student groups.

Conclusions

As far as this study is concerned, this scale seems to differentiate between groups judged clinically to differ in attitude toward children. Two factors that seem to have a favorable influence on attitudes as measured by this scale are: classroom instruction on children's behavior problems and parental counselling. Other apparently significant factors include: clinical training as contrasted with training to be a classroom teacher, and marital status. Age, sex, years, and types of teaching experience do not seem to affect scores significantly.

This scale might seem to be useful as a tool to select groups of parents who need counselling, and to help indicate the areas where most help is needed. It might be used as a screening device to evaluate potential clinicians. The teacher of courses dealing with children's behavior problems might use the scale to determine his effectiveness in attitude changing. No attempt was made at this time to set up norms on the scale, although that is now in progress. Further study is needed before the scale can be regarded as 'completed'.

Since this part of the study was completed, the scale has been shortened to 98 items by eliminating the least significant items. The shortened form has been used with a number of additional groups. Results of these further studies will be reported later.[1]

[1]The scale is available for use by researchers and clinicians and can be obtained by writing to the author.

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An Experimental Study of Artificial-Larynx And Esophageal Speech

Melvin Hyman

Laryngectomized patients may be trained to develop esophageal speech or advised to use an artificial larynx. In the absence of experimental evidence, the choice of method has necessarily been determined by previous experience or personal preference of the physician or speech pathologist in charge of the case.

Several writers advocate esophageal speech, with little evidence to support their views; others write in Aristotilean terms of employing either the artificial larynx or the esophageal method of speech production.

The purpose of this experiment was to compare selected aspects of esophageal speech, artificial-larynx speech, and normal speech.

Procedure

Twenty-four persons participated as experimental subjects in the investigation. They included equal numbers of (a) artificial-larynx speakers,[1] (b) esophageal speakers, and (c) normal speakers. The age range for the three groups was from 40 to 65 years. All of the subjects except two were men; there was one woman in the esophageal group and one woman in the normal group. The investigator and two trained assistants established the following criteria for the selection of laryngectomized cases: (a) the respective type of speech had been used for at least six months, and (b) individuals selected were considered to be 'good' or 'effective' speakers. The laryngectomized speakers were matched with normal speakers in occupational and educational backgrounds.

Each subject spoke into an Altec Lansing microphone, model 200B, located six inches directly in front of his lips. The speech was recorded on a Magnecorder tape recorder, model PT6-A at a speed of 7.5 inches per second.

Preferences. This phase of the study was concerned with the preferences of college students for the voices of artificial-larynx or esophageal speakers.

Each speaker read a standard prose selection of 132 words entitled, 'My Grandfather.' (Henceforth this will be referred to as the 'standard passage.') The informal directions given to each speaker were: 'Read this paragraph as though you were reading it aloud to your wife (husband) or a friend. Read it naturally.' Each speaker was given one practice read-

[1]The artificial larynges employed by the subjects were of a reed type, number two, produced by the Western Electric Company.

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TABLE 1. Order of presentation of recordings of subjects (S) to listeners in a modified paired-comparison technique. Only one half of the order of presentation is represented in this table.

Subject (S)	*Compared With*	*Subject (S)*	*Subject (S)*	*Compared With*	*Subject (S)*
1		2	12		13
1		3	12		14
2		3	13		14
2		4	13		15
3		4	14		15
3		5	14		16
			15		16

ing in which he demonstrated that he could recognize and say the words in the selection.

The first sentence of the passage, 'You wish to know all about my grandfather,' was removed from the selection recorded by each artificial-larynx and esophageal speaker and was employed in a paired-comparison technique to determine preferences of voices by college students. To compare 16 sentences with each other in two orders would involve N(N-1) or 16 (16-1) comparisons, and would require an hour and 15 minutes. In order to reduce the time required of the judges, a special technique suggested by Guilford (*3*) was employed. The sentences were ranked 1 to 16—most preferred to the least preferred voice—by three students of speech correction. Recordings of the 16 were then rearranged on the magnetic tape. The reading that was ranked highest became the first recording on the tape and was designated *Subject One* (S_1). This reading was succeeded by *Subject Two* (S_2), etc.

Each subject was compared with the two subjects immediately preceding and following in rank according to the scheme in Table 1. This scheme illustrates only one half of the presentation of stimuli, or one order. A counterbalanced or two-order system was employed to negate an order effect in the presentation. For example, subject rank one was both the first and second member of pairs in the comparison with subject rank two (*ab* and *ba*). These recordings of the subjects were rearranged (by editing and splicing the tape) in the indicated order, and copied onto 12-inch discs to facilitate the presentation of the pairs to the listeners. The disc recordings of the subjects were then played in random order to 100 college students in elementary speech and English courses. The following directions were given to the listeners:

> You will hear two speakers reading the same materials. After the second speaker has finished, write the number *1* or *2* according to the speaker whose *voice you would prefer to listen to.* Do the same for the other pairs of speakers. Do not leave any space blank—guess if you have to—but write only one number for each space. Remember, write only after the second speaker of a pair has finished.

The recordings were heard in classroom quiet. Two subjects had a sound level that equalled the average sound level of all the subjects as measured with a VU meter. The record-

ings of these two subjects were played to the listeners at an approximate level of 60 db. The distance from the loudspeaker to the middle of a row of 12 listeners was approximately three feet. The level was determined with the sound level meter[2] placed three feet from the loudspeaker, along the axis of the cone of the loudspeaker. The attenuator on the phonograph was fixed throughout the entire testing procedure. For each aspect studied, the listeners gave a total of 200 judgments regarding each pair of speakers. The number of judgments in which one subject was preferred over the second subject of a pair was tabulated. These figures were tested by chi-square to determine whether the results could have occurred by chance alone.

The procedures for determining the preferences among college students of loudness levels and duration of reading of artificial-larynx and esophageal speakers were similar to those described for determining preferences of voices. Ranks of the same subjects' recordings of the sentence, 'You wish to know all about my grandfather' were determined by the therapists for each attribute of voice investigated. The recordings of these subjects were rearranged on the magnetic tape according to the scheme described previously and copied on the 12-inch discs. Three groups of 100 college students participated as listeners, one group for each aspect of voice studied. Chi-square tests were employed for both loudness levels and duration of reading.

Physical Measurements. This phase of the study was concerned with the physical measurements of sound pressure and duration of reading of artificial-larynx, esophageal, and normal speakers.

While magnetic tape recordings were being made of the first reading of the standard passage, the attenuator dial on the recorder was fixed. Thus, variations in relative sound pressure from subject to subject were included on the records. The magnetic tape recorder fed a level recorder (Sound Apparatus Company; 50 db potentiometer), and graphic records of the duration and pressure characteristics of the readings were obtained. The three highest amplitudes or peak deflections of the stylus within each second of reading time were measured and the mean of the three was computed. The level for the entire selection was computed, in turn, from these means as an arbitrary indication of each speaker's sound pressure level. These mean values were treated as basic measures in a three by eight array, three columns (type of speech) with eight (subject) values in each column and subjected to analysis of variance.

According to Fletcher (2), the average speech power is the 'total speech energy radiated over any period, divided by the length of the period.' Somewhat in keeping with Fletcher, the graphic tracings enclosed an area in which horizontal dimensions represented time and vertical dimensions represented relative sound pressure levels. A planimeter was employed to integrate the graphic records. These measurements were of two kinds: (a) integrated sound pressure levels for the first five seconds of graphic level recordings of speech and (b) integrated sound pressure levels for the first five seconds of speech omitting pauses. In each case,

[2]General Radio Sound Level Meter, type 759-B, scale C, setting slow.

measurements of two five-second periods of recording were obtained. Since the second measurement never differed by more than 1/20 from the first, the first measurement was taken as representative of integrated sound pressure level for each speaker. Analysis of variance was employed to test for significant differences among the means of the three groups of speakers.

Another aspect considered was the range of sound pressure of the speakers. Each speaker produced three vowel [ɑ] sounds as 'loud' as possible and as 'soft' as possible. The mean value of the 'loud' vowel sounds was obtained by averaging the three highest peak deflections (one peak from each sound) recorded by the stylus on the power level recorder. The same procedure was employed in obtaining the mean of the 'soft' productions of the vowel. The difference between the two means represented the range of sound pressure for each speaker.

Values of the duration of the readings were computed from the horizontal dimensions of the graphic recordings of the spoken materials. The original measurements were transferred into time units (seconds).

Intelligibility. This phase of the study was concerned with the identification by listeners of words and sounds produced by artificial-larynx, esophageal, and normal speakers. Lists of words from a multiple-choice intelligibility test (*1*, *4*), recorded by the speakers on magnetic tape were played to a total of 120 listeners in five sound-level conditions. There were 24 listeners for each condition; 12 listeners were located approximately nine feet from the loudspeaker and 12, thirty-six feet from the loudspeaker. The five conditions were: (1) the speaker with the 'softest' sound level was heard at 68 db as measured by a sound level meter placed midway between the two rows of listeners; the remaining speakers were relatively 'louder'; (2) the esophageal speakers with the modal sound level for their group were heard at 68 db and the remaining speakers were heard relatively louder; (3) artificial-larynx speakers with the modal sound level for their group were heard at 68 db and the remaining speakers were heard relatively 'softer'; (4) each speaker was heard at a sound level of 78 db; (5) each speaker was heard at a sound level of 78 db with a background of 73 db of white noise. The intelligibility score for each speaker was the percentage of words correctly identified by the listeners. Analyses of variance were employed to test for significant differences among the mean intelligibility scores of the three groups of speakers.

In another measurement of intelligibility, each speaker read aloud a total of 58 monosyllables; these were composed of 21 consonants in the initial position followed by [ɑ], 21 consonants in the final position preceded by [ɑ], and 16 vowels and diphthongs. These were recorded and presented to seven college students who transcribed the monosyllables into phonetic symbols. The number of sounds correctly identified for each speaker was tabulated and converted into percentage values. The differences in intelligibility among the 24 speakers were tested by means of analysis of variance.

Results

Preferences. In comparing the voices of the artificial-larynx and eso-

phageal speakers, the artificial-larynx speakers were always preferred. Twelve out of the thirteen comparisons were significant at the one per cent level of confidence and one comparison was significant at the five per cent level of confidence. There were individual differences among the speakers with artificial larynx and among the esophogeal speakers. The results of the chi-square anaylses revealed that 28 out of 29 comparisons (artificial-larynx *vs.* artificial-larynx as well as *vs.* esophageal speakers) were significantly different from chance at the one per cent level of confidence. One of the 29 comparisons did not show significance at the five per cent level of confidence or above. This comparison was between two speakers with artificial larynx, both considered by the original judges to be in the top quartile of preferred voices. Since 13 out of 13 comparisons of esophageal *vs.* artificial-larynx speakers were in favor of speakers with artificial larynx, it appears that college students believed the voices of the artificial-larynx speakers to be more pleasant than the voice of the esophageal speakers.

When the judges were asked to indicate which loudness level was preferred, the loudness levels of the speakers with artificial larynx were preferred over the esophageal speakers in 10 out of 12 comparisons at the one per cent level of confidence. In the two remaining comparisons, the esophageal speakers were preferred over the artificial-larynx speakers at the one per cent level of confidence. There were individual differences among the speakers in each group. Of the 29 comparisons, 27 were significant at the one per cent level of confidence and one comparison was significant at the five per cent level of confidence.

With respect to duration of reading, the speakers with artificial larynx were preferred over the esophageal speakers in four out of eight comparisons at the one per cent level of confidence. In one comparison, the esophageal speaker was preferred over the artificial-larynx speaker at the one per cent level of confidence. Thus, the artificial-larynx speakers were preferred more than 50 per cent of the time in judgments of duration of reading. Results of the chi-square tests also revealed individual differences in each group of speakers. Twenty-five

TABLE 2. Summary of means and (t) values.

	Artificial Larynx	*Esophageal*	*Normal*	*t*
Sound Pressure	33	23	29	A and N t=3.86* E and N t=4.01* A and E t=7.01*
Range of Sound Pressure	7	11		A and E t=2.12†
Duration	350.2	384.8	311.5	A and N t=4.04* E and N t=3.64* A and E t=2.21‡

* Significant at the one per cent level.
† Approximates significance at the five per cent level.
‡ Significant at the five per cent level.

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out of twenty-nine comparisons were significant at the five per cent level of confidence.

Physical Measurements. Using the highest amplitudes or peak deflections of the stylus on the power level recorder as an indication of sound pressure levels, the relative means[3] for the the three groups of speakers were found to be 33, 23, and 29 db for artificial-larynx, esophageal, and normal speakers, respectively. The *F*-ratio was significant at the one per cent level of confidence and each group was significantly different from every other. These results are summarized in Table 2.

The values of the *F*-ratios were significant at the one per cent level of confidence when the planimeter was employed in measuring sound pressure for speech with pauses and without pauses. In considering the integrated sound pressure for speech (including pauses), the esophageal group was 4 db lower than the artificial-larynx and normal speakers; the artificial-larynx and normal speakers were approximately the same. The mean values for the three groups of speakers for integrated sound pressure levels of their speech (omitting pauses) were computed and the esophageal group was 3 db lower than the artificial-larynx and normal speakers. The normal speakers were approximately 0.3 db less intense than the artificial-larynx speakers. In each case the mean of the normal and artificial-larynx speakers was significantly different from the esophageal speakers at the one per cent level of confidence. The normal and esophageal speakers were significantly different from one another at the one per cent level of confidence. The artificial-larynx and normal speakers were not significantly different from each other with either set of measurements (speech including pauses and speech omitting pauses).

The mean range of sound pressure for artificial-larynx speakers and esophageal speakers was 7 db and 11 db respectively. The difference between the two groups approximated the five per cent level of confidence. The esophageal speakers had a wider range of sound pressure than did the artificial-larynx speakers.

The mean values of the groups in duration of reading of the standard passage were 350.2, 384.8 and 311.5 seconds for artificial-larynx, esophageal, and normal speakers respectively. The *t* values between the means of normal and artificial-larynx speakers, and between normal and esophageal speakers respectively were significant at the one per cent level of confidence. The means of esophageal and artificial-larynx speakers were significantly different at the five per cent level of confidence. Differences in duration of reading were significant among the three groups of speakers. The normal speakers were the fastest talkers and esophageal speakers the slowest talkers.

Intelligibility. In the first four conditions tested, the normal speakers were significantly more intelligible than artificial-larynx and esophageal speakers at the one per cent level of confidence with either row of listeners. The artificial-larynx and esophageal speakers were significantly different at the five per cent level of confidence in *Condition One* when listeners were located nine feet from the loudspeaker; in the other condi-

[3]These figures are above a reference level of 50 db relative to .0002 dynes/cm².

TABLE 3. Summary of analyses of variance of the means for intelligibility conditions one to five.

Location of Listeners from Loudspeaker	*Conditions*	*Source of Variation*	*df*	*Variance*	*F*
9 Feet	One	Between Groups	2	1301.40	13.86*
		Within Groups	21	93.88	
		Total	23		
36 Feet	One	Between Groups	2	806.14	11.42*
		Within Groups	21	70.62	
		Total	23		
9 Feet	Two	Between Groups	2	900.16	17.47*
		Within Groups	21	51.53	
		Total	23		
36 Feet	Two	Between Groups	2	798.10	18.33*
		Within Groups	21	43.53	
		Total	23		
9 Feet	Three	Between Groups	2	593.20	12.17*
		Within Groups	21	48.75	
		Total	23		
36 Feet	Three	Between Groups	2	449.42	13.09*
		Within Groups	21	34.33	
		Total	23		
9 Feet	Four	Between Groups	2	703.40	13.13*
		Within Groups	21	53.58	
		Total	23		
36 Feet	Four	Between Groups	2	570.37	10.45*
		Within Groups	21	54.58	
		Total	23		
9 Feet	Five	Between Groups	2	61.47	2.15†
		Within Groups	21	28.56	
		Total	23		
36 Feet	Five	Between Groups	2	16.32	0.81†
		Within Groups	21	20.08	
		Total	23		

* Significant at the one percent level of confidence.
† Not significant at the five percent level of confidence.

tions they were not significantly different from each other at the five per cent level of confidence. There were no significant differences among the groups in *Condition Five*. These results are summarized in Tables 3 and 4.

The mean gross scores for sounds that were correctly identified were 160, 188, and 288 for artificial-larynx, esophageal, and normal speakers, respectively. The *F*-ratio was significant at the one per cent level of confidence. The normal and artificial-larynx speakers, and the normal and esophageal speakers were significantly different from each other at the one per cent level of confidence. The artificial-larynx and esophageal speakers were not significantly different at the

TABLE 4. Summary of means and t values of eight artificial-larynx (A), eight esophageal (E) and eight normal (N) speakers when reading lists from the multiple-choice intelligibility test.

Location of Listeners from Loudspeaker	*Condition*	*Groups*	*Means*	*t*
9 Feet	One	A	48.0	A and N t=5.72*
		E	56.4	E and N t=3.34*
		N	73.0	A and E t=2.83†
36 Feet	One	A	44.6	A and N t=4.14*
		E	50.4	E and N t=3.33*
		N	64.5	A and E t=1.68‡
9 Feet	Two	A	44.0	A and N t=5.55*
		E	50.9	E and N t=4.46*
		N	64.9	A and E t=1.81‡
36 Feet	Two	A	40.3	A and N t=5.97*
		E	46.2	E and N t=4.22*
		N	59.5	A and E t=1.67‡
9 Feet	Three	A	43.4	A and N t=4.37*
		E	50.2	E and N t=3.49*
		N	60.8	A and E t=2.01‡
36 Feet	Three	A	41.8	A and N t=4.42*
		E	45.8	E and N t=4.17*
		N	56.1	A and E t=1.32‡
9 Feet	Four	A	48.2	A and N t=4.91*
		E	51.8	E and N t=3.90*
		N	66.1	A and E t=0.98‡
36 Feet	Four	A	43.1	A and N t=4.24*
		E	46.2	E and N t=3.71*
		N	58.9	A and E t=0.79‡
9 Feet	Five	A	34.6	
		E	35.8	
		N	38.9	
36 Feet	Five	A	33.2	
		E	35.1	
		N	36.4	

* Significant at the one per cent level of confidence.
† Significant at the five per cent level of confidence.
‡ Not significant at five per cent level of confidence.

five per cent level of confidence. The rank order correlations between the five intelligibility conditions and the monosyllabic test for esophageal and artificial-larynx speakers were .80, .69, .62, .66, and .36 respectively. The ranks in the first four intelligibility conditions appeared to be related to the ranks in the monosyllabic test at the one per cent level of confidence.

The English speech sounds of the monosyllabic test given to the three groups of speakers were categorized into consonants and vowels. The vowel sounds for all three groups were identified more times than con-

TABLE 5. Summary of percentages of the four consonant phonemes most rarely identified and most frequently identified.

	Most Rarely Identified		*Most Frequently Identified*	
Artificial Larynx	[θ]	1.8	[s]	58.9
	[ð]	2.7	[w]	57.1
	[ŋ]	7.1	[ʃ]	54.5
	[h w]	8.9	[n]	50.0
Esophageal	[h]	0	[r]	73.2
	[h w]	5.4	[d ʒ]	69.6
	[ð]	9.8	[d]	62.5
	[θ]	12.5	[w]	60.7
Normal	[θ]	17.0	[w]	91.1
	[ð]	22.3	[t]	91.1
	[ŋ]	37.5	[n]	89.3
	[h w]	44.6	[s]	88.4

sonants at the one per cent level of confidence. The consonants were further subdivided: (a) The voiced consonants were identified more times than voiceless consonants for the esophageal speakers whereas the opposite effect took place for the artificial-larynx and normal speakers; (b) The initial consonants for all three groups of speakers were identified more times than final consonants. In a further division of consonants, the following types of consonants are placed in order from most to least frequently correctly identified: affricates, glides, nasals, plosives, and fricatives for the esophageal group; affricates, nasals, fricatives, glides, and plosives for the artifical-larynx speakers; and affricates, plosives, nasals, glides, and fricatives for the normal group of speakers.

Table 5 summarizes for each speaker four consonant phonemes most rarely identified and most frequently identified by the listeners.

Summary and Conclusion

The results of the study indicate that *acoustically*, speech production by means of the artificial-larynx was preferred over esophageal speech. There is probably no significant difference in intelligibility between good speakers who employ the artificial-larynx and the esophageal methods. Further research is needed in testing the *visual* aspects of these two types of speech, to determine whether or not listeners object to seeing the artificial-larynx, and how detrimental this is to the effectiveness of the speaker. Motion picture films with sound could be employed for testing the visual aspects of the speech of the artificial-larynx and esophageal speakers.

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A Consideration Of Etiologies In 454 Cases Of Speech Retardation

Fred B. Goodwin

Most authorities agree on the factors responsible for speech retardation. Among them are mental retardation, hearing loss, brain damage resulting in either poor motor coordination or cortical malfunction, previous illness during the 'speech readiness' period, emotional problems, and, in general, poor methods of teaching a child to talk (*1, 2, 3, 4*).

A paucity of data exists relative to the frequency with which the various factors operate as causal agents. Such information is needed for better understanding of the problem.

This investigation was not undertaken as an attempt to derive normative data, although it is hoped it may be a step in that direction. The data were collected in a medical center. They are, consequently, probably contaminated by medical problems. Nevertheless, a cross-section of speech retardation etiologies as seen in one type of clinical situation is presented. To that extent the study adds to the total knowledge of the problem of delayed speech.

Procedure

Data were reviewed on 454 cases of speech retardation, 177 females and 277 males. The median age was 4 years, 2 months; the range was from 21 months to 12 years. A frequency distribution of ages is found in Table 1. The data were compiled during 1953 and 1954 in the State University of Iowa Department of Pediatrics and on the Mobile Field Clinics of the Iowa State Services for Crippled Children. Diagnosis of speech retardation in each case was made by at least one of three Speech and Hearing Consultants affiliated with the State University of Iowa Hospital, Department of Pediatrics, during 1953 and 1954. The children received, in addition to a speech and hearing evaluation, a complete medical examination and an intelligence test.

Medical examinations were done by S. U. I. Hospital staff members or

TABLE 1. Frequency distribution of ages (median age: 4 years, 2 months) of 454 children with retarded speech.

Age	*Number*
21 mos. to 2 years	26
2–3	77
3–4	107
4–5	96
5–6	71
6–7	38
7–8	19
8–9	9
9–10	3
10–11	5
11–12	2
12–13	1
	454

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resident physicians in the Departments of Pediatrics, Orthopedics, or Otolaryngology. Individual psychometric tests were administered by a clinical psychologist employed in the S.U.I. Hospital Department of Pediatrics and a team of clinical psychologists from the Iowa Division of Child Welfare. Each of the psychologists was well experienced in testing motor handicapped and speech retarded children. Final determination of etiology was made by a speech pathologist on the basis of the various examinations. In no case was an etiology named if the child did not have what was considered by the examiners to be a diagnostically adequate medical and psychological examination. For example, a few children with cerebral palsy had such severe motor involvement that it was felt a valid psychometric test could not be obtained. Some children were too young to test accurately for mental retardation. Occasionally, further medical evaluation was deemed necessary before a definitive diagnosis was possible. In these cases, the etiology of the retardation was labeled as 'deferred.'

Etiologies were categorized as follows: (1) mental retardation—that is, an IQ of less than 70; (2) brain damage, including cerebral palsy, convulsive disorders, and a type of damage resulting from encephalitis which is clinically characterized by hyperactivity, short attention span, and vacillating emotions; (3) hearing loss; and (4) functional factors.

Results

The most frequent factor held to be responsible for speech retardation was mental retardation. Two hundred forty-one of the children had IQ's of less than 70; 162 of these had no physical deviations and 78 were brain-damaged, 47 having cerebral palsy, and 31 having convulsive disorders or the post-encephalitic syndrome without cerebral palsy. One child was both mentally retarded and had a severe bilateral loss of hearing. Thus, in 53% of the cases, mental retardation was felt to be a causal agent. Twenty-one children, or slightly less than 5%, had retarded speech as a result of hearing impairment.

TABLE 2. Frequency of occurrence of primary etiologies in 454 cases of retarded speech.

Etiology	*Number*	*Percentage*
Mental retardation	162	35.68
Functional	53	11.67
Hearing loss	21	4.63
Brain damage	42	9.25
Brain damage with mental retardation	78	17.18
Hearing loss with mental retardation	1	.22
Deferred	97	21.37
	454	100.00

Aside from the 78 brain-damaged children who were also mentally retarded, there were another 42 cases of brain damage in which there was no evidence that mental deficiency also was responsible for slow speech development.

Fifty-three, or approximately 12% of the cases, were believed to have a functional factor as the basic causal agent. Two of these were referred for psychiatric treatment. In 97 cases, or 21%, etiology was deferred; sixty-eight as a consequence of what were felt to be inadequate psychometrics. A summary of the results may be found in Table 2.

Discussion

Since the cases selected for this study were not randomly obtained, generalizations about the 'true' population are untenable. Nevertheless, the frequent occurrence of mental retardation makes it hard to minimize as an important factor in speech retardation. Taking into consideration the high incidence of mental retardation among brain-damaged children, and acknowledging the large number of brain-damaged children involved in this study, mental retardation still seemed to be the most significant etiology. Even if no brain-damaged children had been included in the cases reviewed in this study, the percentage of mental retardation among the remaining cases still would have been 43%. No other single factor appeared as frequently.

The percentage (65%) of mental retardation among brain-damaged children in this investigation might be considered high, but it is comparable to the findings summarized by Wolfe (*5*). In a study of children with cerebral palsy, he reports 44% feebleminded, and 22% with borderline intelligence. Further, the children with the post-encephalitic syndrome would tend to increase the incidence of retardation among the brain-damaged subjects beyond that which one would expect in dealing with cases of cerebral palsy alone.

The small number of cases with a functional primary etiology may be a function of the contamination by medical problems. The results of this study in no way imply that functional factors are to be found in few cases of speech retardation. It is to be emphasized that what was under consideration was the primary diagnosis. Mixed diagnoses were assigned in cases where no one of the four basic etiologies could be isolated as primary. Although only salient diagnoses were recorded, there is little doubt that in certain of the cases functional factors were operating secondarily. When a mother is faced with the feeding and locomotion problems of cerebral palsy, speech stimulation is likely to be somewhat neglected. Obviously, in every case functional causation should be investigated by the speech therapist.

Second only to the number of children who were mentally retarded was the number of children on whom etiologies were deferred. Making the basic assumption that the personnel who performed the various examinations were competent, this figure indicates the diagnostic difficulties still inherent in the problem of speech retardation. Even in a situation where the abilities of various specialists are pooled in a team approach, it is still difficult in many cases for the speech therapist to determine the causal factors accounting for speech retardation. This represents, perhaps, an index both of how complex the problem of speech retardation may be, and of how difficult it is to make a definitive diagnosis, especially a psychological one.

Summary

Data were reviewed with reference to etiology on 454 cases of speech retardation seen at the State University Department of Pediatrics and on the Mobile Field Clinics of the Iowa State Services for Crippled Children. Etiologies were named by a speech therapist on the basis of a speech and hearing evaluation, a complete physi-

cal examination by a medical doctor, and an individual psychometric evaluation by a clinical psychologist. If an adequate evaluation by each examiner could not be obtained, etiology was deferred. Mental retardation was found to be the most frequent causal factor, 53% of the cases having IQ's below 70. Approximately 26% of the children were brain damaged; 65% of this group were mentally retarded. In 21% of the cases, etiology was deferred. In 12% of the cases, the primary etiology was functional. Approximately 5% of the speech retardation was secondary to hearing loss.

Conclusions

Limitations imposed by the strata from which this sample was drawn preclude the use of the data as normative. Taking this into consideration, however, the frequency with which mental retardation occurred, plus the percentage of cases with mental retardation but without medical deviations supplies considerable evidence to support Brown's (*2*) assertion: 'The most important cause of marked speech retardation is mental deficiency.'

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A Mobile Unit Speech Therapy Program

Lilian Landauer Anderson

At a meeting of the California Elks Association in September 1950, it was decided to adopt as a major project the rehabilitation of cerebral palsied children in isolated areas of California. The Major Project Committee studied plans for the organization of the project and issued the following objectives:

1. To aid in the facilities for care of the Cerebral Palsied
2. To contribute to new and intensive medical research programs
3. To assist in scholarships for training skilled personnel
4. To assist in parent education of Cerebral Palsied children (*1*)

To date, 87 physical therapy scholarships, 40 occupational therapy scholarships, and 165 teacher scholarships have been granted by the Association. (*2*)

The Association is also sponsoring a medical research project involving autopsy on the brains of cerebral palsied individuals; this research is being conducted by Dr. H. W. Magoun at the University of California Medical School in Los Angeles.

The first home therapy mobile unit was established at Eureka, California. Eureka, the headquarters for this division, is 90 miles south of Oregon and 290 miles north of San Francisco. It is the largest city in either of the two most northern counties in California, Humboldt and Del Norte. The area is a relatively isolated one, with a limited supply of specialized services.

In 1951, there were only a few known cases of cerebral palsy in the area. However, it was estimated that there were probably fifty cases or more scattered throughout this widespread and rapidly growing section of California. Here the California Elks Association decided to launch its first Cerebral Palsy Home Therapy Unit. It consisted of a physical therapist and an occupational therapist; each was furnished with a station wagon and was allowed to equip it with what she considered essential for the work. One year later, a speech therapist also equipped with her own station wagon, was added to the division, thus forming a complete rehabilitation team. To date there are four such divisions (with plans for a fifth one) in operation throughout California; these are located in Indio, Auburn, Lancaster, and Eureka. The latter has the only speech therapy unit in operation but Auburn will soon follow suit.

Before this project went into operation, much planning and consideration was necessary. Assisting and guiding the California Elks Association was the California Society for Crippled Children, the State Department of Public Health, and the California Department of Education. A functional working plan was devised. The project has developed into an active, consistently growing program which has realized its main goal: to aid children with cerebral palsy and

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other physical handicaps; also to alert the community and to assist it in establishing facilities for these youngsters.

At the inception of the speech therapy program the Eureka Division had nine cases. The case load is now 28, of which 13 have cleft palates and 15 have cerebral palsy. The speech therapy unit travels approximately 1600 miles every month and visits homes in most remote areas. The treatment time in each home varies from 45 minutes to an hour depending upon individual need.

The program is conducted under the medical supervision of Dr. Paul A. Grigorieff, an orthopedic specialist and consultant to the Humboldt Del Norte Bi-County Department of Public Health Crippled Children Service. A Cerebral Palsy clinic administered by the Crippled Children's Service Division is scheduled each month. New cases are diagnosed and the orthopedist prescribes treatment. Cases already on the program are seen at regular intervals for re-examination. The clinics are held in the Physical Therapy Department of the Franklin School in Eureka. Before a child is admitted to the examining room, his case is reviewed by all the personnel working with him. Problems are discussed with the orthopedist, referrals are made for psychometric examinations, to the hearing or eye clinics, and occasionally to the Cerebral Palsy Diagnostic Center of the University of California Hospital.

After the child has been examined, the orthopedist may confer with the therapists or with the parents for any necessary clarification. At this time, the therapist makes all appointments with new cases and thus takes the opportunity to acquaint herself with the location of the patient's home. The therapist tries to become familiar with the family routine so that her visits will not conflict with meal hours or rest periods. A few days after the clinic meeting, each therapist is supplied with a clinical report from the Health Department or with any other report from a referring agency which pertains to her case.

The local health department assists the therapists; Dr. John A. Carswell, County Health Officer, has given time and guidance to aid the project; facilities of the department are made available to the therapists. All mail pertaining to the project is received there and telephone messages are taken. The department has also offered space for records and for office equipment. The files of the health department have been made available to the therapists and can be used at any time. The Administrator of the Crippled Children's Service and the Director of Nursing have their offices in the same building and their accessibility helps in the formation of an efficient program.

The speech therapist, aside from attending the Cerebral Palsy Clinic, also attends a Plastic Clinic. Dr. Horace F. Klabunde, Plastic Surgeon and Consultant to the State Crippled Children's Service comes to Eureka from San Francisco at regular intervals. He stays for two days, devoting the first day to surgery; the second day he examines and diagnoses patients and prescribes treatment as well. All of the cleft palate cases have been referred to the therapists through this clinic. As in the case of the orthopedic clinic, patients are required to return for re-examination and for referrals to other clinics or agencies as indicated.

When attending these clinics the therapist takes a minimum of equipment: her filing case with the reports and progress notes of each patient, a flashlight, some sugar coated tongue depressors or lollipops, and some pictures and small objects to stimulate the child to speak. If a scheduled case is already on her program, the therapist instructs the parent to bring some of the material with which the child is familiar. This helps the plastic surgeon in evaluating what has been done with the child so that he can ascertain whether further surgery is indicated.

The work is organized as a home therapy program; however, before working with the child, the mother must go through a training period. Her role is similar to that of a student taking supervised clinical practice in a speech clinic. Consequently, the initial visits are handled by the therapist with the parent observing. At this time, the therapist can best determine the needs of the child, the extent of the involvement, and the general language ability. She can obtain a detailed picture of his speech profile and outline and discuss a plan of procedure with the parent. This writer has found that most parents understand little of how speech develops, how the articulators function and what is necessary in order to provide an advantageous home environment for language development.

Many families do not understand the reasons underlying their child's condition. One mother was convinced that her child had a cleft palate because it had sucked its thumb while she was carrying it. Another felt that because the father had a high palatal arch her child had inherited cleft palate. Consequently, some time is given to educating the parents in terms of modern theories of possible causes, variations, incidence, and prognosis of the cleft palate condition. Parents must also learn that the rehabilitation process may be extended over a number of years. All too often they expect quick remedies or immediate cures. Parents are also given appropriate literature to read on the subject of their child's problem. The therapist finds it wise to mark certain parts that are pertinent to a given case. After the material has been read, the therapist discusses it with the parents in order to find out if it is understood and accepted.

After an evaluation of the child's speech has been completed and a plan of therapy developed, the parent may be encouraged to participate. The therapist may say, 'Look at Mommie and see how she does it.' or 'Let's ask Mommie and see if she knows the answer.' Thus the parent is gradually drawn into the activity. Some parents are fearful and feel inadequate in working with their child and need encouragement. One parent of an aphasic child said, 'I'll never learn how to do that.' Another asked, 'Will I ever have the patience?' But in time the parent becomes accustomed to the visits. She changes from the role of spectator to participant and eventually has an active role under the direction of the therapist.

Not all parents, however, can learn to work with their handicapped child. Occasionally the rapport between the mother and her youngster is poor. There may exist a basic lack of understanding or a desire to push the child too strongly. In order to avoid the chance of having a resentful and negative child some other individual may have to take

over the therapy program. Usually there are brothers and sisters who are interested and can be effective in working with the patient. Adolescent girls have proved to be very efficient as junior therapists. One sixteen year old girl has liked the role so well that she plans to attend college and train for speech therapy.

In some instances both parents are employed and cannot be present to observe the therapist. This has occurred with several older children on the program. Other arrangements must then be made. Humboldt State College, at Arcata, California, has been helpful in furnishing speech correction majors who desire experience. High schools have assisted in finding suitable quarters in their buildings for speech therapy sessions. The student meets with the therapist weekly and then is given instructions concerning the treatment plan for the following week. In one area, the college was too far away so a student from the high school had to be trained. The counselor played an impotant role in locating this student who was interested in working with handicapped individuals as a future career. So, in these cases, the parent training program, out of necessity, has become a student training program.

The therapist has all the essential equipment for carrying out a home therapy program in the station wagon. It is so arranged as to be easily accessible through the three doors of the conveyance. All items are portable and can readily be carried into the home. The largest pieces of equipment are the portable tape recorder and phonograph.The other materials are carried in boxes which are labeled and stacked in such a way as not to be disrupted while driving over bumpy country roads or in making sharp turns. These materials include:

- Case history forms and records
- Tapes
- Mirror
- Spirometer
- Tissues
- Stop watch
- Rutherford tongue instruments
- Telephones
- Blowing devices
- Devices to motivate tongue, lip, and jaw activity.
- Puppets
- Boxes of materials labeled:
  - Sounds the animals make,
  - Anagrams,
  - Objects for nursery rhymes,
  - Alphabetized picture index cards,
  - Sound and word drill on clothes,
  - Objects for sound identification,
  - Miniature books,
  - Motivation devices;
- Literature for parents
- Speech testing kit
- Flannel board
- Games, books and educational toys.

In using these materials the goal is always explained to the parent so that she does not lose sight of the purpose of the activity. At first, the relationship between such motivating devices and indirect techniques are not always clearly understood by the mother. Unless guided properly, she may discard them in favor of a more direct approach which may not be effective in a given case.

After the material or equipment is demonstrated to the mother, it may be left with her; when it has served its purpose, others are introduced. Because of the rotation of pieces of her equipment the therapist must maintain an equipment lending library. Index cards are kept which tell the date the piece was issued and the date it was returned. In this manner, the therapist knows where her material is at all times.

Frequently, parents wish to purchase some of the speech training de-

vices. The therapist may give them the address of the manufacturer or may procure one for the family herself. It is usually easier for the therapist to make the purchase than it would be for a parent living on a ranch or in some rural section far from a shopping center. Thus in time, a miniature, individualized speech clinic is built up in the home, geared to suit the needs of a particular child.

Realization of the importance for parents of children with similar problems to get together led to the formation of a Cerebral Palsy Parents' Group in November of 1951. At first the group was sponsored by the local Crippled Children's Society and the Parent Teachers Association. Later, a Parent Planning Committee was appointed, which has since directed the activities of the group. Visiting speakers have discussed the Medical Aspects of Cerebral Palsy, Physical Therapy, Occupational Therapy, Speech Therapy, Nutrition, and other phases of Special Education. Movies are provided by the California Society for Crippled Children. The parent group is now in its fourth year. It has changed its name from 'The Cerebral Palsy Parent Group' to the 'Cerebral Palsy Study Group,' thus hoping to attract the public at large. It is hoped that a general understanding of the problem will reach other interested groups besides parents.

One of the major projects of the parent group was to confer with and to assist where possible, the superintendents of the city and county schools in the formation of a special class for cerebral palsy children. This class now meets at the Franklin School in Eureka. It began in the fall of 1952 and started with 11 children; currently it has 13 children. The class has one teacher trained to work with the cerebral palsied and a matron. It now has expanded and accepts other orthopedic cases aside from cerebral palsy. At present there are two polio youngsters. Five children of the class are able to attend some regular classes and they eventually will leave the special class in order to join a regular classroom. Plans are now in operation for the opening of a special section for exceptional children at the Worthington school in Eureka. It will include children with other handicaps besides cerebral palsy.

Since the fall of 1954, the Franklin School has had its own physical therapist who treats the children in the special class and other youngsters from neighboring areas as out-patients. This has lightened the case load of the physical therapist of the Cerebral Palsy Mobile Unit and has made it possible for her to take other orthopedic cases who would otherwise not have therapy available to them. Plans are also in progress to employ an occupational therapist for the special class in the fall of 1955.

The parent group was also responsible for the formation of a recreation group which meets at the Ryan Youth Center in Eureka. This group has made it possible for parents to come in to town to do their shopping and to leave their cerebral palsy child as well as their other children to participate in the activities at the center. The Girls' Service League has offered its services in directing some of the games and some of the singing. The children have been taken for picnics, airplane rides, and fishing. Photography lessons are offered for the older children.

The parents project for the future is to persuade influential members of

the community to assist in establishing a sheltered workshop in Humboldt County.

The three therapists confer at regular intervals about their own programs and treatment procedures. Schedules of appointments are shared and therapists know which localities their co-workers visit on any particular day. Thus, in a home without a telephone, they may act as messengers for each other or deliver equipment which might not have been available at the time of an earlier visit. Patients are also discussed and, in families requiring a combination of services, an integration of the therapies is attempted. Drooling, for instance, was a severe problem with a certain 18 year old athetoid. All the therapists and the teacher worked jointly in helping this boy to establish some control. A method which proved effective was developed in speech therapy and was then followed by the other therapists in working with the boy.

Speech therapy and occupational therapy integrate well in the team approach. Lotto games make effective speech drills and at the same time can be used for training grasp and release and supination and pronation of the hand. The magnetic fish game may be used by the occupational therapist for extension of the wrist and by the speech therapist for language development. The physical therapist, too, can integrate her program with work in breathing, relaxation, or in the use of the rhymes and singing games used with some of the conditioning exercises. The therapists also report progress to each other and comment on any changes they have observed during treatment time. Carry-over from one therapy situation to another is particularly noted and reported among the therapists.

The home therapy program has proved effective; however, it has weaknesses. It is not as easy to eliminate distracting stimuli in the home during therapy as it would be in a clinic situation. Household interruptions tend to divert the child. In some homes, as in the case of a few families who live in trailers, the accommodations are so small that it is impossible to ask other members of the family to remain in a different room; the weather may be bad and there just is no other place to go. Television sets often provide severe competition for the visiting speech therapist.

In home therapy, the handicapped child does not enjoy the advantages of group education and therapy with other similarly handicapped youngsters; he is always competing with normal children and adults. Lacking the formality of the clinic situation, the therapist must always be on guard against becoming too involved in family problems which have no bearing on her case. Her routine visits may be occasionally interrupted by illness in the family, out of town guests, or a birthday party. Such incidents excite the child and minimize his ability to cooperate in the therapy situation.

On the whole, however, a home training program lends itself well to speech training because meaningful use of language basically evolves out of a desire to communicate with other members of the family unit. The speech therapist, as a result of her direct contact with the family, can get a first hand impression of interpersonal relationships and of the speech handicapped child's position in this unit. A younger sibling may be in the

habit of interpreting the wants of the cerebral palsied child for him, or the mother may give the child what it needs without waiting for verbal demands. Being in a position to observe such activities, the therapist can inaugurate such changes as are necessary to provide more adequate verbal stimulation and motivation in speech education. The therapist may sometimes purposely visit the home at meal time so that she can observe the family's eating habits and see whether the type of food given to the child helps serve the basic functions of chewing, swallowing, or sucking. When it is observed that little use is made of the speech mechanism in the process of eating, a program of parent training to help the child develop better habits of mastication and deglutition will be established. It would be difficult to duplicate such situations in a clinical set-up.

Various organizations within the community have proven to be interested in this project and cooperative. Local women's groups have volunteered their services to make equipment such as sandbags, beanbags, and picture cards for sound and word stimulation. The local Elks Lodge has been sponsoring Christmas parties for the past four years with either Elks wives or parents of cerebral palsied children assisting. Last year some of the physical education teachers of the local high schools gave their time to teach swimming to several of the children from the special class. For many of these youngsters such activities are novel experiences. The local Crippled Children's Society has helped in furnishing typewriters, full length mirrors and have also contributed to the equipment of the special class. The Elks Lodge has provided articles such as a wheel chair, a posture chair, and a gym mat.

Therapists on the Cerebral Palsy Mobile Unit have addressed groups such as the Parent Teachers Association, the Crescent City Woman's Club, and the Business and Professional Women on the subject of the home therapy program. This has served to focus the attention of the community on the cerebral palsy children and the question of their future as members of this community.

The citizens of Eureka are realizing the ultimate goal of the Cerebral Palsy Mobile Unit, that of establishing permanent facilities to care for cerebral palsied children and adults. It has the special class and will eventually have larger and more permanent quarters with completely equipped educational and therapeutical accommodations. Active steps are now being taken to establish a sheltered workshop, the ultimate dream of the parents of the Cerebral Palsy Group. When the children in these two northwestern counties of California are adequately provided for—with the necessary transportation, therapy, and education—the Mobile Unit will have fulfilled its function. It will be ready to pilot another program in another community.

References

1. Pamphlet issued by the California Elks Association, 1950.
2. Report of the Major Project Committee, California Elks Association, October 8, 1954.

Issues In Ethical Practice

The Committee on Ethical Practice is acting as a clearing house for members of ASHA to communicate with each other about issues in ethical practice. Members are invited (1) to submit brief descriptive accounts of situations which illustrate or raise questions regarding ethical practice, and (2) to send comments on the cases published in the *Journal*.

A section meeting at the national convention in Los Angeles will be devoted to issues in ethical practice. Contributions should be sent to Ollie Backus, Chairman, Committee on Ethical Practice, ASHA, Box 2025, University, Alabama.

The following cases have been selected for presentation in this issue:

Case 15. A speech therapist with a Ph.D degree started a full time private practice in speech therapy in a city several years ago. A large Speech and Hearing Clinic already existed in that city as part of a charity hospital for children. The clinic charged fees for its services if the patient was able to pay but the fees were relatively small and bore no relation to the cost of the services. The director of the clinic refused to send any patients to the private therapist or change the fee policies of his clinic so that persons who could afford it would be encouraged to patronize the private practitioner. The clinic director justified his behavior in this matter on the grounds that his clinic was in that city first and that he needed all the patients and money he could get. The private practitioner finally appealed to the local medical society to force the local speech clinic to abide by the 'charity' rules laid down for the hospitals.

Case 16. A young man received a graduate degree in speech from a university. His major area of concentration was in public address with something less than a minor in speech and hearing disorders. He has been representing himself, however, as a qualified speech clinician. He is teaching a beginning college course in speech correction, handling clinical case work, and participating in the training program for student therapists.

Case 17. A state university has an extension center in a large city. This center has a speech and hearing program in therapy that runs for the regular 10 month academic year. The therapists do not have employment on the staff during the summer. During a recent summer, one of the therapists became affiliated with a hearing aid distributor in the city as a salesman. Presumably the therapist's work as a hearing aid salesman was to be for the summer only and was to be entirely independent of his affiliation with the university extension center. During the time of his direct employment, his address and telephone contacts continued to be at the University Center. During that summer he made numerous contacts and carried on activities pertinent to selling hearing aids, hearing aid accessories, and to making hearing evaluations for prospective purchasers. When the summer ended and his employment as a hearing aid salesman terminated, the therapist had a number of additional contacts regarding the sale of aids and accessories. I do not believe he actively attempted the sale of aids when the fall school term began, but persons whom he had contacted during the summer continued to seek service from him.

In talking with this man, who was trained as a speech and hearing therapist, it became apparent that he was strongly prejudiced in favor of the hearing aid company he had represented. This prejudice was reflected in his reluctance to have patients referred to a university hearing center for consultation instead of having them referred directly to a dealer.

Case 18. As a group, the medical profession in my county has been very helpful to our correction program. One doctor, however, an influential physician with a large practice, still tests the hearing of children with a watch. One of my first graders is having a great deal

of trouble both with his speech and with his reading. Repeated audiometer tests clearly indicate that he has a mild low frequency loss and a severe loss above a thousand cycles. After receiving my note concerning this loss, the mother took the child to the family doctor, in this case the above mentioned physician. After testing the child with a watch, he questioned the loss and reassured the mother that the child would outgrow the speech and reading problem. I went to my superintendent for help, and was advised to accept the doctor's judgment. I accepted my superintendent's advice, but I wonder whether I have done the right thing.

Case 19. I am a speech therapist in a small town. In the school district adjacent to ours, there is a child with a severe stutter. My superior gave me permission to see this child, but refuses to let me work with the child on school time and he disapproves of my working with him on my own time. I am working with the child during evenings and Saturdays. I wonder if I am justified in taking this step.

Case 20. The wife of a young lawyer in a town with no speech program has recently started doing fee work in her home with children and adults. This is the only service of this type available in that area. The woman is not a member of ASHA or any other speech correction group. The college from which she graduated does not offer a major in speech correction. I have not met the woman, nor have I heard anything bad about her. When I have been asked, I have declined to recommend that people avail themselves of her services.

Case 21. I am a speech therapist and a member of ASHA. I graduated with high recommendations from a recognized training center. I was drawn into speech correction because I was a severe stutterer in junior high and high school. At the present time my own speech is good unless I think people know I once stuttered badly, in which case I become self-conscious and begin to stutter again. When I applied for my present position I described myself as having no personal problem which might interfere with my teaching. Recently I told my immediate supervisor that I am a stutterer with the understanding that the information would go no further. She broke this confidence by telling it to the superintendent. Although nothing has yet been said to me, my own speech is beginning to bother me because I feel that my colleagues are now listening critically. I do not feel that my supervisor was justified in relaying this information which I revealed spontaneously and informally.

Case 22. In our community the success of the speech correction program is evaluated in terms of the number of cases we work with and the percentage of cures. We are forced to turn in very precise records to substantiate our program. After completing my speech survey I found that my immediate supervisor wanted me to work with a large number of functional articulatory cases and more or less to ignore a few cases of severe delayed speech for whom the etiology is obscure. I have insisted on working with these more severe problems and in so doing I have lost the cooperation of my supervisor. I wonder how much I am justified in following the dictates of my conscience in this case.

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Book Reviews

ZEDLER, EMPRESS YOUNG, *Listening for Speech Sounds.* Garden City, New York: Doubleday and Company, Inc., 1955. Pp. 145. $3.00.

This book grew out of the author's feeling that the young speech clinicians who are being trained in her college speech clinic have a definite need for entertaining materials which they can use in auditory training. Secondly, she hopes that it will give classroom teachers techniques for speech development, directly useful in phonics work and 'based upon present-day principles of elementary education.' She suggests that through the use of this material the classroom teacher and the speech correctionist can supplement each others' work, and that this coordination will make for positive results in the learning of the pupils.

The book is divided into three parts, and is very concise and well organized. Part I contains information and instructions for clinician and teacher, Part II contains the 'Tommy' stories which cover the consonants, and Part III the 'Tommy' stories for vowels and diphthongs. Part III was included at the request of many classroom teachers.

Tommy is a little boy who likes to listen to sounds, identify them, imitate them, learn the 'letter-picture' which stands for each sound, and then check to see if they are 'word sounds' by listening for them as people talk. Dr. Zedler makes a special point of the importance of listening for the sounds in sentence context first. She feels this sequence embodies the principle of analysis rather than synthesis. Also, it makes use of the established principle of working from the known to the unknown.

These stories have real interest for children and they will find it easy to identify with Tommy and be carried along in his sound experiences.

The author states that 'the purpose of the book is to offer material which can be used to equal advantage in both clinical and classroom situations.' The value of these stories and the approach suggested is readily conceded as far as the classroom teacher is concerned, but the question might be justifiably raised as to whether clinicians should need such materials.

Dr. Zedler recognizes that some of the associations formed in the stories may not be equally meaningful for all children. In such cases she advises the teacher or clinician 'not to tax her own ingenuity and imagination to change the story, but rather to present the speech sound and the letter symbol to the children and ask them to suggest associations from their own experiences. It was in this manner that most of the "Tommy" stories came to be.'

It would appear that this important point constitutes the essence of what is Dr. Zedler's real contribution to clinicians—an understanding of the *techniques* of the active process by which children can be drawn into living associations and experiences with sounds.

PATRICIA LINDAMOOD
University of Minnesota

SCHRAMM, WILBUR (ed.) *The Process and Effects of Mass Communication,* Urbana: University of Illinois Press, 1954. Pp. 586. $6.00.

Although originally compiled for use in training new employees of the U. S. Information Agency in the field of international communication, the selections in this volume are now offered as 'background necessary for making an intelligent approach to any other kind of social communication.'

Following the editor's introductory essay, 'How Communication Works,' there are six major sections: *The Primary Effect—Attention, The Effect of Different Channels, Getting the Meaning Understood, Modifying Attitudes and Opinions, Effects in Terms of Groups,* and *Special Problems of Achieving an Effect with International Communications.* Each section includes an introduction by the editor and one or more papers on a topic subsumed by the sectional subject. In two of the sections, the papers are grouped under subsectional headings. At the end of the volume are a bibliography of 100 briefly annotated entries and two indices—one of names and one of subjects.

Book Reviews is edited by Ernest H. Henrikson, University of Minnesota.

Of the 38 separately titled papers which constitute the bulk of this book, nearly half appeared originally as chapters in social psychology texts or in books bearing such titles as *Mass Persuasion* and *Propaganda in War and Crisis*. Most of the remainder—some in more complete form—first appeared as articles in periodicals, *Public Opinion Quarterly* being the most frequently cited one.

Of the several dozen authors who contributed to the volume, the names of Lazarsfeld, Krech, Doob, the Hartleys, Osgood, Hovland, Cantril, and Lasswell have a familiar ring to the reviewer. Students of mass communication would undoubtedly recognize the names of most of the other contributors.

Dr. Schramm's experience would appear to be well suited to the editorial work required by such a book. After having achieved a distinctive position in academic, literary and journalistic circles, he turned to the study of communication as a social science. The success of his efforts is shown by his appointment to the directorship of the Institute of Communications Research at the University of Illinois. He is now dean of the Division of Communications on the same campus.

Readers of this journal, most of whom are concerned primarily with inter-personal communication, may find little in this book which is directly pertinent to their professional problems. To those whose interests transcend the basic processes of speech and hearing, this attractively bound compendium is recommended.

CHARLES LIGHTFOOT
Northwestern University

ALMY, MILLIE. *Child Development*. New York: Henry Holt, 1950. Pp. 490. $6.00.

The author of this book gives the reader an understanding of growth and learning from infancy to adulthood by using the lives of six individuals as a frame of reference. She is unusually successful in making the reader aware of a complex, developing organism influenced by environmental pressures and demands.

Two convictions of the author have dictated the organization of the book: (1) 'Child development principles and the findings of research become meaningful only as their relevance to the lives of children become clear,' and (2) 'The significance of development is best grasped when the child's life experience can be viewed through succeeding age periods.'

In acquainting the reader with the goals, behavior, and family picture of six 18-year-olds at the time of their graduation from high school, the author utilizes anecdotes and illustrations from their lives at various ages. Although many illustrations from the lives of other children appear, the frequent references to the same persons at different ages has a real impact in clarifying the meaning of development.

Although the author does not attempt to survey or catalogue the extensive research literature in this field, a knowledge of the educational and sociological as well as the psychological literature permeates her writing and interpretations. She believes that the biological, social, and psychodynamic aspects of development are important to growth and learning at every age. These are discussed as the infant grows into the child and the child into the adult. The effect of differences in intelligence, growth, and personality of the individual as well as in parental influences and the financial and social status of the family is recognized and considered.

After the first chapter, 'Adults in the Making,' the developmental sequence is essentially followed from a discussion of heredity and prenatal development through the periods of infancy, childhood, and adolescence. One chapter interrupts the sequence to discuss 'Studying Children and Youth.' In this chapter the 'reason for being' of research with children is warmly presented. While this chapter would not qualify as a reference for research method and design, it does emphasize the value of research techniques in enhancing the understanding of children and their growth.

Throughout the book problems for discussion are included. Sometimes the author's point of view about the problem is expressed. Often it is supported with suggestions for further reading and with illustrations from the lives of children, particularly the six high school graduates.

This book is particularly important because of the delightful interpretation of research knowledge with an appreciation and understanding of children. In this book children do not become phenomenon. Neither is the wealth of research on their growth and development ignored. The book, I believe, fulfills the author's aim of serv-

ing 'as a useful introduction to the tremendous amount of literature which is available' for the parents, educators, other professional workers with children, and the young people for whom the book was written.

MILDRED C. TEMPLIN
University of Minnesota

Errata

Phonetic Equipment of Spastic and Athetoid Children by Orvis C. Irwin, March 1955.

In Table 4 on page 56, under the column headed Tension Athetoid, the values should read 31.0, 31.2, 40.5, 48.1, 66.9, 49.8.

On page 56, beginning at the bottom of the left hand column, elide the phrase 'in spite of the fact that the table indicates greater values for the tension athetoids.'

Abstracts

HOOPLE, G. D. and BREWER, D. W. Voice production in the laryngectomized patient. *Ann. Otol., etc., St. Louis,* 63, 1954, 640-650.

'A study of voice . . . in the laryngectomized . . . utilizing kymographic and tape recordings of the phonatory apparatus, when checked by statistical analysis, showed a definite difference in the mechanics by which air was trapped in the pharynx and esophagus by high intelligibility speakers as compared with low intelligibility speakers. Cine-fluorographic studies during, phonation, confirmed by repeated fluoroscopic examinations demonstrated that in the patients studied crico-pharyngeal sphincter control was the deciding factor as to where and when the air was trapped. Furthermore, the folds of the sphincter were seen to represent the primary source of sound vibration for voice production. When initial laryngectomy voice training is designed so that the patient can trap air in the upper third of the esophagus without deglutition the highest intelligibility is obtained, although excellent intelligibility can be secured by utilizing the full act of swallowing. (*W.R.T.*)

TATO, J. M., MARIANI, N., DE PICCOLI, E. M. W. and MIRASOV, P. Study of the sonospectographic characteristics of the voice in laryngectomized patients. *Acta otolaryng.*, 44, 1954, 431-438.

The speech patterns of 12 laryngectomized patients were analyzed on the Sona-Graph. The results of this analysis indicated that at the beginning of voice training the fundamental had a frequency from 30 to 60 cps. After speech training this fundamental varied between 60 and 150 cps. Also the vowel [o] had a higher pitch than any of the other vowel sounds. This latter result was exactly opposite to the findings for normal subjects.

A therapy program which stressed the development of variations in the fundamental resulted in an improvement of the quality of esophageal speech. (*J.J.O.*)

MILLER, G. A. and NICELY, P. E. An analysis of perceptual confusions among some English consonants. *J. acoust. Soc. Amer.* 27, 1955, 338-352.

The non-random character of errors in consonant recognition was explored by analysis of the errors in recognition made by five talker-listeners for 16 different consonants over a system into which varying distortions were introduced. Seventeen conditions of signal to noise ratio or high and low pass filtering were investigated. Six pages of results are presented in the form of 'confusion matrices' to allow the reader to make his own calculations from the original data. Results indicated that, 'with noise or low-pass filtering the confusions fall into consistent patterns, but with high-pass filtering the errors are scattered quite randomly. An articulatory analysis of these 16 consonants provides a system of five articulatory features or "dimensions" that serve to characterize and distinguish the different phonemes: voicing, nasality, affrication, duration, and place of articulation. The data indicate that voicing and nasality are little affected and that place is severely affected by low-pass and noisy systems.' Analyses are presented in terms of articulation scores and information transmission. (*W.R.T.*)

POLLACK, I. Masking by a periodically interrupted noise. *J. acoust. Soc. Amer.* 27, 1955, 353-355.

'This study considers the effect of a wide range of intermittent noise conditions upon: (1) the masked threshold of a 1000-cycle tone and (2) the intelligibility of monosyllabic words.' The results describe the masking as a function of (1) the ratio

Abstracts is edited by Dorothy Sherman, University of Iowa, assisted by the following committee: Asa J. Berlin, Pennsylvania State University; Virginia B. Carroll, Minneapolis Veterans Hospital; Frederic L. Darley, State University of Iowa, Inez E. Hagerty, Mt. Holyoke College; Parley W. Newman, Utah State Agricultural College; John J. O'Neill, Ohio State University; Jean Parker, Iowa City; Maryjane Rees, Sacramento State College; Frank B. Robinson, Miami University; Vivian I. Roe, University of Indiana; George H. Shames, University of Pittsburgh; Joseph G. Sheehan, University of California; Barbara S. Street, Minneapolis Veterans Hospital; Wayne L. Thurman, Eastern Illinois State Teachers College; William R. Tiffany, University of Washington.

between the level of bursts of noise and the level of the noise in the interval between bursts, (2) the portion of each cycle occupied by noise burst, and (3) the number of noise bursts presented per second. It was found that 'for a given inter-burst ratio, the masking produced by an interrupted noise is primarily dependent upon the interval between successive noise bursts.' Speech intelligibility was found to decrease as the between burst noise level was increased. (*W.R.T.*)

POULTON, E. C. and STEVENS, S. S. On the halving and doubling of the loudness of white noise. *J. acoust. Soc. Amer.*, 27, 1955, 329-331.

This study was undertaken to supplement previous data on loudness ratio judgements and to produce more information about 'the factors that produce distortions and biases in loudness judgements.' An improved 'sone potentiometer' was used to obtain half loudness and double loudness judgements described as 'reasonably representative of the best that can be achieved with the "method of adjustment" . . .' The change required to produce a 2:1 loudness ratio varied from about six to 10 db. (*W.R.T.*)

STEVENS, S. S., ROGERS, M. S. and HERENSTEIN, R. J. The apparent reduction of loudness: A repeat experiment. *J. acoust. Soc. Amer.*, 27, 1955, 326-328.

The authors report a repetition of the 1932 experiment of Laird, Taylor, and Wille on the relation between loudness and intensity. The discrepant half-loudness judgement data of these investigators were found to be a result of the judgemental method employed. (*W.R.T.*)

VON DEN BERG, Jr. Calculations on a model of the vocal tract for vowel [i] (meat) and on the larynx. *J. acoust. Soc. Amer.*, 27, 1955, 332-338.

'As a sequel to experiments on the transmission of the vocal cavities, calculations on a model of the vocal tract for the vowel [i] (meat) are performed to determine the magnitude of the impedances along the vocal tract and the relative contribution of radiation, friction, and coupled vibrations of the cavity walls to the total damping. Calculations also are made to estimate the impedances of the different parts of the larynx. From these calculations the effects of the coupling of the vocal cavities upon the larynx can be understood. Finally an old singing-pedagogical problem concerning the resonances in the head is discussed.' (Author's precis)

HUIZINGA, E. On the microphonic effects in the labyrinth of the pigeon and the function of the round window. *Acta otolaryng.*, 44, 1954, 487-489.

When an opening was made in the bony semicircular canal of the pigeon and the cochlea was removed, it was possible to record a cochlear microphonic from an electrode placed in the labyrinth. This vestibular reaction did not occur if there was no opening in the semicircular canal. This result was construed as offering support to the hypothesis that the presence of two openings (windows) is of primary importance in the production of a microphonic effect in the cochlea. (*J.J.O.*)

LIERLE, D. and REGER, S. Further studies of threshold shifts as measured with the Bekesy-type audiometer. *Ann. Otol., etc., St. Louis*, 63, 1954, 772-784.

Three experiments concerned with the measurement of temporary threshold shift with the Bekesy audiometric technique are described. Experiment One measured the TTS produced by a 1000 cycle, 20 db, one-minute, pure tone when a 40 db tone was administered to the contralateral ear simultaneously with the fatiguing tone. The threshold shift produced by this binaural condition was about eight db and was not significantly different from the monaural condition. In Experiment Two the TTS was found for pure tones which were masked with white noise during the exposure. Under this condition no significant threshold shift was found. In Experiment Three the cumulative effects of exposure were investigated by making short TTS measures between 30 successive one-minute, 1000 cycle exposures. It was found that most of the shift occurred with the first few exposures. The authors conclude that 'the threshold sensitivity of the ear is more susceptible to fluctuations from low intensity level sound exposures than formerly realized.' One of the implications drawn by the authors is that in audiometry the threshold should be approached only from inaudibility to audibility. (*W.R.T.*)

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LINDQUIST, S. E., NEFF, W. D. and SCHUKNECHT, H. F. Stimulation deafness: a study of hearing losses resulting from exposure to noise or to blast impulses. *J. comp. physiol. Psychol.*, 47, 1954, 406-411.

Eight experimental animals, adult cats with one ear surgically destroyed, were conditioned to run forward in a rotating cage at an auditory signal. Audiograms for the range 62.5 to 16,000 cps were determined. Unanesthetized cats were stimulated three times with intense amplified noise for 15, 30, and 60 minutes after intervals of complete recovery; anesthetized cats were stimulated by a .32 caliber starting pistol, with the stimulation repeated after recovery or loss was determined. Following observation of behavior under these conditions, the experimental animals were killed and histological studies of each cochlea were made.

Among the significant findings were the following: (1) the focus for both types of hearing loss was 4,000 cps, (2) permanent or severe hearing loss was associated with degeneration of the upper band and lower middle turns of the cochlea, (3) mild loss (30-40 db) showed much less defined damage to the cochlea, (4) complete recovery from hearing loss was possible within forty-eight hours or less, even with as great a loss as 80 db. (*I.E.H.*)

MALMO, R. B., BOAG, T. J. and RAGINSKY, B. B. Electromyographic study of hypnotic deafness. *J. clin. exper. Hypnosis*, 2, 1954, 305-317.

The authors report the results of a study which attempted to investigate similarities and differences between hypnotically induced deafness and hysterical deafness. Four subjects, two with normal hearing, one with hysterical deafness, and one with 'middle ear' deafness, were studied. A 700 cps tone was presented at a level 90 decibels above the auditory threshold. As this tone was presented binaurally through earphones, muscle potentials were recorded from the chin, the sternomastoid, and the neck. The normal subjects were tested while under hypnosis and in a waking state.

The differences between potentials for the waking and hypnotic states were statistically significant for all three points. Similar results were obtained for the case of hysterical deafness. These results indicated that there was not complete deafness for the hypnotic and hysterical states. During the waking state there was definite adaptation (in terms of muscular response) to the tone. In the hypnotic state there was an almost immediate inhibition of response. Also, in the instance of hysterical deafness there was a marked emotional reaction when the sound was perceived. This sort of response did not occur for the hypnotic type of hearing loss. (*J.J.O.*)

MEURMAN, Y. and MEURMAN, O. H. Do the semicircular canals play a part in directional hearing? *Acta otolaryng.*, 44, 1954, 542-555.

Three groups of individuals, 10 with normal hearing, nine with unilateral deafness, and seven with bilateral fenestrations, were administered tests of auditory localization in an effort to determine if the semicircular canals assist in such a phenomenon. The subjects were tested in a horizontal and erect position. The auditory stimuli were pure tones (125, 1000, 2000, and 4000 cps) presented at a level 40 to 60 decibels above the threshold of hearing. The tones, which were interrupted periodically, were presented from four azimuths: 0°, 90°, 180°, and 270°.

The normal hearing subjects experienced the most difficulty in localizing sounds in the frontal plane. The unilaterally deaf subjects tended to localize tones more toward the side of the hearing ear, while performance of the bilaterally fenestrated subjects was similar to that of the normal subjects but with many more errors. These results were interpreted as an indication that the semicircular canals do offer some assistance in directional hearing. (*J.J.O.*)

RUEDI, L. Actions of vitamin A on the human and animal ear. *Acta otolaryng.*, 44, 1954, 502-516.

The author reports the results of an investigation of the effects vitamin A has on the human and animal ear after acoustic trauma. In the instance of the human ear it was found that administration of vitamin A apparently shortened the time of physiological fatigue from four minutes to one minute. Also, the critical intensity for exposure to white noise was increased by some 10 to 15 decibels. Thus, the administration of vitamin A increased the threshold for auditory fatigue but did not change the auditory threshold for a normal ear. The author postulates that such an adaptation to auditory fatigue is due to a chemical adaptor which may be situated in the stria vascularis. (*J.J.O.*)

EICHENLAUB, J. E. Hear again. *Today's Hlth.*, 33(5), 1955, 24-25, 40-42.

A non-technical discussion of the nature and causes of hearing disorders is presented. The use of hearing aids, their advantages, costs, and methods of selection are described. Warnings are given for the person who 'shops' for a hearing aid without professional assistance. (*W.L.T.*)

GLORIG, A. Malingering. *Ann. Otol., etc., St. Louis*, 63, 1954, 802-815.

The author points out that an important facet of the functional hearing loss problem is the determination of the presence or absence of willful intent. 'Unless willful intent to defraud can be shown by a voluntary or an inadvertent admission, malingering cannot be proven.' Several old and new testing techniques for malingering are discussed. The author concludes that for the most part they demonstrate the difference between functional and organic loss and add weight to the case against the malingerer, but do not prove intent. The delayed speech feedback test is presented as the most promising in this respect. The author believes that a 'high order' neural block in the psychogenic case will prevent confusion, while 'the malingerer should be confused because he is unable to control the effects of the delayed speech on his monitoring feedback circuit.' (*W.R.T.*)

HOOPLE, G. D., DIXON, R., KNIGHT, E. and DICARLO, L. M. Clinical study of bone conduction audiometry. *Ann. Otol., etc., St. Louis*, 63, 1954, 785-801.

An exploratory study designed to measure the effects of water douche masking on air and bone conducted sounds is reported. Measures obtained on 20 normal subjects included loudness judgements of the water noise, free field, and bone conduction thresholds obtained during bilateral douching, and thresholds obtained during monaural douching. The study was later extended to 21 persons with unilateral hearing losses. The authors conclude that 'water-douche masking produces a masking effect in the order of 90 db by air conduction and 45-50 db by bone conduction. The effect is obtained even though noise is not a significant factor in the total masking observed. Though data are incomplete, it may be that water-douche masking may be less likely to result in elevated thresholds in the unmasked ear than high intensity noise masking.' (*W.R.T.*)

KEASTER, J. An inquiry into current concepts of visual speech reception (lip reading). *Laryngoscope*, 65, 1955, 80-84.

The author points out that little is known about the variables associated with lip reading ability. In view of this, 'a study is outlined which will attempt to correlate such ability with specific psychological aptitudes and with projective tests of personality in order to arrive at some clues as to how to make lip-reading instruction more effective for those people who have difficulty learning the art.' (*W.R.T.*)

LEVINE, E. S. and GROHT, M. A. Nursery school and the deaf child. *Volta Rev.*, 57, 1955, 199-209.

A general discussion of the advantages of nursery school experience for the deaf child is presented. Specific topics discussed include the psychological background of the deaf, the psychological values of special nursery schools, questions involved in choosing a school, and what to expect in a nursery program for deaf children. (*F.B.R.*)

LEZAK, R. J. State cooperation with local communities in a hearing conservation program. *West. Speech*, 19, 1955, 83-86.

Under the Pennsylvania plan, case finding is the responsibility of the school nurse and otological diagnosis the responsibility of the local otologist. Speech and hearing rehabilitation centers supported by the Division of Special Education, Pennsylvania Department of Public Instruction, conduct audiological analysis and furnish speech and hearing therapists who serve schools on an itinerary basis.

The role of the classroom teacher as a therapist is discussed, and an outline of some of the problems in the management of hearing loss is suggested for use in group discussions by personnel working with hearing problems. (*M.R.*)

WALSH, T. E. and GOODMAN, A. Speech discrimination in central auditory lesions. *Laryngoscope*, 65, 1955, 1-8.

Audiometric findings for four cases with central lesions (according to operative data) are reported. The data include threshold for pure tones, speech threshold for spondees, discrimination (PB Max.) score, and a recruitment measure. 'It is of central interest that speech discrimination in these cases is remarkably poor in re-

lation to threshold loss, and that this obtains in the absence of recruitment.' Partial recruitment was found in only one case where there had been an interference with cochlear blood supply. Diplacusis was noted in three cases. (*W.R.T.*)

McDaniel, M. The role of the occupational therapist in the re-education of the aphasic patient. Part I. *Amer. J. occup. Ther.*, 8, 1954, 235-240.

In view of the shortage of trained speech therapists, the author emphasizes the frequent need for occupational therapists to assume the major responsibility for helping the aphasic patient relearn communicative skills. Part I, first in a series of three articles, reviews the language problems and nonlanguage characteristics of the adult aphasic and outlines general principles of language retraining of aphasic patients. (*I.E.H.*)

McDaniel, M. The role of the occupational therapist in the re-education of the aphasic patient. Part II. *Amer. J. occup. Ther.*, 9, 1955, 10-14.

The second article in the series on the occupational therapist's role in working with aphasic patients presents specific techniques and materials for receptive and expressive language disorders to be used by the occupational therapist in the absence of a speech therapist. (*I.E.H.*)

McDaniel, M. The role of the occupational therapist in the re-education of the aphasic patient. Part III. *Amer. J. occup. Ther.*, 9, 1955, 63-64, 77.

This article outlines a correlated program for language relearning when the occupational therapist can work under the guidance of the speech therapist to reinforce the aphasic patient's increasing use of language. (*I.E.H.*)

Allen, R. M. and Collins, M. G. Suggestions for the adaptive administration of intelligence tests for those with cerebral palsy. *Cerebral Palsy Rev.*, 16, 1955, 11-14.

Specific test considerations and methods of adaptation are described for administration of the Ammons Full-Range Picture Test, Columbia Mental Maturity Test, Raven's Progressive Matrices, and the Leiter International Performance Scale. Considerations for hearing, speech, motor, and visual deviations are indicated for each test. (*J.P.*)

Katz, E. Can the mental abilities of the cerebral palsied be measured? *Calif. J. educ. Res.*, 6, 1955, 3-8.

Items of the Stanford-Binet Intelligence Scale Form L, Years II through VI, inclusive, are grouped according to common characteristics: bead stringing, pointing, picture vocabulary, numbers, drawing, and memory. By studying the results of tests with the items grouped, better understanding of the cerebral palsied child's potentialities can be obtained. (*M.R.*)

Boyle, J. and Nielsen, J. M. Visual agnosia and loss of recall; report of a case. *Bull. Los Angeles neurol. Soc.*, 19, 1954, 39-42.

Consequent to trauma to the occipital lobes in brain surgery, a 31-year-old patient first developed blindness with lack of awareness of it, then visual agnosia for inanimate objects, and later the loss of ability to revisualize. At no time was the patient aphasic. (*J.G.S.*)

Friedman, A. and Levison, A. Neurological disorders in children. *Arch. Pediat.*, 72, 1955, 51-69.

This article gives the incidence of and describes neurological cases at the Children's Division of the Cook County Hospital of Chicago during a 12-month period. Cases were grouped according to etiology as follows: heredodegenerative and metabolic conditions, congenital malformations, birth injuries, meningitis, encephalitis and encephalopathy, craniocerebral trauma, vascular and hematologic conditions, neoplastic conditions, convulsions and mental retardation, and neuromuscular disorders. (*J.P.*)

Kibbe, M. H. Clinical and laboratory findings in two hundred head injuries. *Neurology*, 5, 1955, 336-352.

Two hundred head injuries consisting of open non-penetrating injuries, penetrating injuries, and closed injuries were analyzed according to the region of the brain injury, duration of unconsciousness, neurologic signs, EEG findings, mental changes, epileptiform seizures, aphasia, degree of brain damage, headaches, dizzy spells, and disposition.

The right parietal and left temporal areas showed the most severe clinical and laboratory changes in all three types of injuries. In the open penetrating and closed

injuries the bilateral occipital and multilobar injuries were also severe. The left frontal region was severely involved in only the open non-penetrating injuries.

The most significant clinical and laboratory findings indicative of cerebral damage were the disposition, spinal fluid total protein, duration of unconsciousness, EEG changes, degree of brain damage, neurologic findings, and presence of headaches. The data were further analyzed for relationships existing among the clinical and laboratory findings. Statistically significant relationships were found for each type of injury. (*B.S.S.*)

Moor, F. B. Diagnosis and treatment of idiopathic facial paralysis (Bell's palsy). *J. Amer. med. Ass.*, 157, 1955, 1599-1601.

Etiology, pathology, diagnosis, and prognosis of idiopathic facial paralysis are discussed. Treatment by local heat, electrical stimulation, massage, exercise and splinting the face are described. The present outlook is held to be encouraging provided treatment begins early and is intensive. (*W.L.T.*)

Thelander, H. E. Pediatric evaluation of brain-damaged children. *J. Pediat.*, 46, 1955, 699-703

A report is made of the pre-nursery school program for children with cerebral palsy at Children's Hospital in San Francisco. The physical, intellectual, and emotional status of the children is discussed as well as some socio-economic problems and therapy approach. Tables are presented on primary and secondary diagnosis in 131 cases with an attempt to classify etiological factors. (*J.P.*)

Van Buskirk, C. and Webster, D. Prognostic value of sensory defect in rehabilitation of hemiplegics. *Neurology*, 5, 1955, 407-411.

Thirty-five hemiplegic patients, ranging in age from 31-76, were evaluated weekly for disturbance of the impaired side. Pain, two-point discrimination, and vibratory sense were all found impaired about equally. Two-point discrimination usually returned first, but if it did not, prognosis was found to be poor.

The authors state that, since two-point discrimination is mediated by the cortex, disturbed parietal lobe function may be a significant factor in determining prognosis. Symptoms seen are cited as various agnosias, loss of memory, disturbed attentiveness, and loss of abstract attitudes. Such disturbances are believed related to poor retraining. (*V.B.C.*)

Baker, H. K. Cleft palate habilitation—present tense. *Children*, 2, 1955, 94-98.

The concept of the clinical team as an important phase in contemporary rehabilitation and habilitation is discussed. The problems and needs of any group of specialists developing into a 'team' are indicated, including the initial competitive exchange of ideas, the constant problem of defining terms for the common understanding of the group, and the need of a democratic leader to help the individuals relate well to the whole team. The Cleft Palate Center at the University of Illinois is presented as an illustration of the team approach with special emphasis on the training program of students from various fields. (*I.E.H.*)

Fonder, A. C. Dental materials and skills in oral and facial prosthesis. *J. Amer. dent. Ass.*, 50, 1955, 636-646.

Treatment of six cases of facial and oral defects with prosthetic appliances is discussed. Three of the cases had cleft palate; three others had facial defects brought about by cancer. The rehabilitative procedures are described with illustrative plates. (*G.H.S.*)

Munson, S. E. and May, A. M. Are cleft palate persons of sub-normal intelligence? *J. educ. Res.*, 48, 1955, 617-621.

An unselected sample of 200 cases was taken from Lancaster (Pa.) Cleft Palate Clinic files. The Wechsler-Bellevue Test (or Wechsler equivalents) was used to obtain IQ's. IQ distribution in the cleft palate group was found to be more varied and somewhat lower than that of normals. Occupational information as compared to that for all Pennsylvania residents indicated that the cleft palate group was not representative. (*W.L.T.*)

Cherniak, R. M., Adamson, J. D. and Hildes, J. A. Compliance of the lungs and thorax in poliomyelitis. *J. appl. Physiol.*, 7, 1955, 375-378.

Twenty poliomyelitis patients and four normal individuals were compared as to lung volume response. A tank respirator

was used, and readings to a series of transient and permanent pressures were made. The values to permanent pressure were higher and considered more valid. Findings indicated that compliance of lungs and thorax is reduced in poliomyelitis, correlating to some degree with decrease in vital capacity. (*I.E.H.*)

FABER, H. K. and DONG, L. Studies on entry and egress of poliomyelitic infection, VIII. The relation of viremia to invasion of the central nervous system. *J. exp. Med.*, 101, 1955, 383-389.

In view of the importance of the recent discovery of viremic infection in poliomyelitis and possible invasion of the central nervous system through the blood stream, a histological study of the central nervous systems of cynomolgus monkeys, previously inoculated with polio virus, was made. Inoculations were given at three levels: femoral vein, carotid artery, and vertebral artery. Results indicated no CNS lesions when inoculations had been given through the femoral vein. Minor lesions of the CNS were found in one monkey inoculated through the carotid artery. Severe and wide-spread lesions in the brain stem, the motor area of the pons, medulla, and spinal cord were found when the inoculation had been through the vertebral artery. (*I.E.H.*)

BLACK, J. W. and TOLHURST, G. C. The relative intelligibility of language groups. *Quart. J. Speech*, 41, 1955, 57-63.

Twelve English-speaking French pilot trainees and 12 English trainees read and recorded two multiple-choice type word list intelligibility tests, recorded five minutes of prose, and served as listeners for each other. Twenty-four American students heard the two intelligibility tests separated by the five-minute prose reading as a 'familiarization' period. Reception scores for dialect speech were improved by the familiarization period. (*W.L.T.*)

LINDBLOM, E. M. On Finnish consonant phonemes and their comparison with corresponding English phonemes. *Language Learning*, 5, 1955, 88-93.

A listing and brief discussion of the phonemic differences between Finnish and English are presented. A major difference is in the infrequent occurrence of consonant clusters or blends in Finnish. It is reported that Finnish words never begin with a consonant blend and very seldom end with one, while English has 39 that occur initially and 151 post-vocalic blends. (*F.B.R.*)

HOLMES, J. A. Factors underlying major reading disabilities at the college level. *Genet. Psychol. Monogr.*, 49, 1954, 3-95.

This study was designed to examine the hypothesis that 'the general reading ability of college students is a composite of speed and power of reading, and that underlying each component is a multiplicity of related and measurable factors.' Data relevant to this hypothesis were collected from 94 college students through the administration of 40 group and individual tests of readings and intellectual, linguistic, motor, and oculomotor abilities, as well as through certain personality measures. The general hypothesis upon which this study was planned has been substantiated by the experiment. (*J.G.S.*)

JANIS, I. L. Personality correlates of susceptibility to persuasion. *J. Personality*, 22 1954, 504-518.

Data on personal adjustment are obtained from clinical reports on counselees and reactions to a personality inventory by another group of subjects. The results support two hypotheses: (1) persons with low self-esteem tend to be more readily influenced and (2) persons with more acute symptoms of neurotic anxiety tend to be more resistant than others. (*J.G.S.*)

LASKO, J. K. Parent behavior toward first and second children. *Genet. Psychol. Monogr.*, 49, 1954, 97-137.

The behavior patterns of 46 mothers as related to their first and second-born children are compared. The data are interpreted as supporting the following conclusions: (1) mothers' behavior toward first as contrasted with second children is 'on the average less warm emotionally and more restrictive and coercive,' (2) mothers' behavior toward second children does not change systematically as the children grow older but there is a systematic reduction in maternal interaction with second children as the latter grow older, (3) mothers tend to be generally consistent in their methods of rearing first and second children, (4) the age difference between first and second-born siblings is an important

determiner of the mother's behavior toward the two children. (*J.G.S.*)

AMUNDSON, C. L. Increasing interpersonal relationships in the high school with the aid of sociometric procedures. *Group Psychother.*, 6, 1954, 183-188.

An experiment is reported on group discussions and other guided interpersonal relationships in the homerooms of adolescent children at Washington Park High School, Racine, Wisconsin. One of the most significant conclusions was that teachers who participated in the project became more observing of interpersonal relationships within their groups, of leadership qualities, and of isolation and rejection than they had been previously. (*J.G.S.*)

BRUCK, M. An example of the use of psychodrama in the relieving of an acute symptom in a psychiatric children's clinic. *Group Psychother.*, 6, 1954, 216-221.

A case history of an 8-year-old boy suffering from tics is cited as an example of the use of psychodrama in a clinical setting to relieve the symptom. (*J.G.S.*)

HALL, K. R. L., and STRIDE, E. The varying response to pain in psychiatric disorders: a study in abnormal psychology. *Brit. J. med. Psychol.*, 27, 1954, 48-60.

An experimental investigation of the response to pain is reported. Four hundred patients varying in sex, age, and diagnostic group were studied. The 'results are interpreted as demonstrating the probability that the major causes of variation in pain tolerance, within this psychiatric population, can all be attributed to differences in central attitude or pain-conceptualization and not to differences in peripheral sensitivity. General discussion of these differences is made in terms of temperamental types.' (*J.G.S.*)

LEVIN, M. Perseveration at various levels of complexity with comments on delirium. *Arch. Neurol. Psychiat.*, 73, 1955, 439-444.

Levin discusses the phenomenon of perseveration and maintains that it may occur at any level of brain function. This includes grasp, posture, speech, and mentation. The occurrence of perseveration at so widely separate levels of function is in keeping with the principle that all levels of the nervous system, however they may differ in complexity, are fundamentally of the same constitution. Perseveration is described as a lack of flexibility and an inability to modify behavior to meet change in a situation. This is most strikingly evidenced in delirium.

The effects on speech of electrical stimulation to specific areas of the cortex are cited and discussed. (*B.S.S.*)

MOSSE, H. L. The Duess Test. *Amer. J. Psychother.*, 8, 1954, 251-264.

Ten short fables designed to elicit material dealing with different phases of the child's psychosexual and psychological development are presented. Sample responses and their interpretations are included. (*J.G.S.*)

MOUSTAKAS, C. E. Emotional adjustment and the play therapy process. *J. genet. Psychol.*, 86, 1955, 79-99.

Six levels of normal emotional growth in the first five years of life are discussed. The function of play therapy for the disturbed child is explained and illustrated by interview excerpts. (*W.L.T.*)

REDWIN, E. The behind-your-back technique in marriage counseling. *Group Psychother.* 8, 1955, 40-47.

An account is given of a group therapy session in which one of six couples was discussed by a variation of Corsini's technique. The couple 'left' the room by turning their backs to the group, which in turn endeavored to discuss them as though they in fact absent. Within this structure, other members of the group were able to offer more personal and penetrating comments to the discussed couple who 'seemed to be able to accept the devastating comments with considerable comfort.' While the method may be too threatening to use in a group that has not as yet formed strong relationships, it did enable this group to discuss otherwise forbidden material and proceed to a deeper level of understanding. (*J.G.S.*)

STOKVIS, B. Group-psychotherapy of enuretic children by psychodrama and sociodrama. *Amer. J. Psychother.*, 8, 1954, 265-275.

A description of the use of psychodrama with a group of children between ages 12 and 15, suffering from enuresis, is given. All the children had lost their parents while quite young. (*J.G.S.*)

COLLEGE OF AGRICULTURE AND STATE OF KANSAS
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SEP 28 1955
MANHATTAN

BLOCH, R. S. How your town can put the handicapped to work. *Today's Hlth.*, 33 (2), 1955, 40-41, 52-53.

The extensive program for employment of the handicapped at Knoxville, Tennessee is described. Suggestions are given for establishing similar programs in other cities. (*W.L.T.*)

CRUICKSHANK, W. M. New horizons in education of the handicapped child. *Amer. J. publ. Hlth.*, 45, 1955, 306-311.

Recent advances in recognition of the needs of handicapped children are discussed. Although the need for individual classes in some cases is recognized, integration of the handicapped with non-handicapped children is urged. The need for honest and realistic diagnosis and prognosis is emphasized. Preparation of more teachers for handicapped children is seen as an immediate need. (*W.L.T.*)

DOLPHIN, J. E. and KVARACEUS, W. C. Selected references from the literature on exceptional children. *Elem. Sch. J.*, 55, 1955, 467-480.

A 133-item bibliography is classified as follows: (1) general references; (2) blind and partially seeing children; (3) crippled children; (4) deaf and hard-of-hearing children; (5) special health problems; (6) speech disorders; (7) subnormal, backward and dull-normal children; (8) behavior and problem cases and dependent children; (9) juvenile delinquency; and (10) superior and gifted children. (*J.P.*)

FURNESS, E. L. A remedial and developmental speech program. *Elem. Engl.*, 30, 1955, 289-295.

This article consists mainly of a chart containing 21 speech disabilities, their possible causes, and procedures to be used by the teacher. Some generalizations regarding the relationship between speech defects and reading disability, and speech defects and writing are discussed. Some objectives of speech instruction are enumerated. (*M.R.*)

GARWOOD, V. P. Speech therapy corner. *West. Speech*, 19, 1955, 73-74, 82, 94.

Answers are given to questions concerning the following topics: psychoanalysis for adult stutterers; courses in counseling and speech arts for public school speech correctionists; helping administrators differentiate between a clinical and a speech improvement program; a base line I.Q. for inclusion in a part time therapy program; and differences among the positions designated speech correctionist, speech therapist, speech consultant, and speech pathologist. (*M.R.*)

Selected references on kindergarten-primary education. (Prepared by the kindergarten-primary staff of the Laboratory School, University of Chicago.) *Elem. Sch. J.*, 55, 1955, 413-417.

A 40-item bibliography gives references on kindergarten-primary education for the year Jan. 1, 1954 to Jan. 1, 1955. Selections have been grouped under (1) general, (2) curriculum, learning experiences, and techniques, (3) parent-teacher-child relationships, (4) investigations and experimental studies, and (5) films. (*J.P.*)

News And Announcements

Significant Trends in the Professions

Pledging full cooperation in any efforts to guarantee the safety and the fair distribution of the Salk polio vaccine, the National Society for Crippled Children and Adults passed a resolution acclaiming and thanking the National Foundation for Infantile Paralysis and Dr. Jonas E. Salk for discovery of the vaccine. Delegates from 44 states were present at the meeting which was presided over by Edgar Kobak.

The American Council on Education has proposed a tax credit plan to aid students in institutions of higher learning. The plan proposed provides that 30 per cent of student tuition and fees actually paid may be applied as a tax credit on the amount of income taxes otherwise payable.

The recent announcement that the U.S.S.R. 'is currently turning out twice as many scientists and engineers as the United States' helped prompt the Carnegie Corporation to grant $20,000 to Massachusetts Institute of Technology for the purpose of studying Soviet advances in scientific and engineering education.

The most important advances and trends in science and technology during 1954 as picked by Watson Davis, director of Science Service, are: (1) conversion of atomic energy radiation directly into electricity, and the development and application of solar batteries turning sunlight into electricity; (2) demonstration of photosynthesis by nonliving green grains extracted from plant cells, and the elucidation of the role of complex sugars and phosphorus in the photosynthetic process; (3) mass trials of a vaccine against polio upon 1.5 million school children; (4) 'Pogo' fighter plane that takes off straight up and lands tail-first; (5) use of naturally radioactive tritium to trace age of water in rain and elsewhere; (6) structure of the center of the Milky Way, our own stellar galaxy, revealed by radio waves generated by the hydrogen gas filling space between the stars; (7) rising apprehension that radioactive material from atomic and H-bombs will poison the earth's atmosphere and affect the continuance of human life; (8) discovery that corn is at least 60,000 years old and native to the Western Hemisphere; (9) revoking of the security clearance of J. Robert Oppenheimer and similar cases that affected adversely the relationships of scientists to government; (10) the successful use of the international language, Interlingua, for abstracts at world medical meetings and in scientific journals.

The Scientists' Committee on Loyalty and Security of the Federation of American Scientists has issued an appeal for information concerning cases in which grants to individual scientists have been denied by the U. S. Public Health Service because of questions regarding loyalty. According to the Committee, the fact that grants have been withheld has been established in one or two instances. The Committee has stated that is does not wish to criticize any division of the Government without being quite certain that there is adequate cause. Information should be addressed to Ernest Pollard, Chairman, 2153 Yale Station, New Haven, Connecticut.

The American Association of Rehabilitation Therapists has created a registry of Medical Rehabilitation Therapists and Specialists. This is an attempt to place in one central file the records and transcripts of all occupational therapists, physical therapists, speech therapists, and persons working in medically associated clinics, so that these qualifications may be subject to review by physicians and others. A certificate and a suitable lapel emblem is given the individual who completes the qualifications of the registry. Individuals

News and Announcements is edited by Mary W. Huber, Los Angeles State College, assisted by the following committee: Sue Earnest, San Diego State College; Lester L. Hale, University of Florida; Henry Moser, Ohio State University; Severina Nelson, University of Illinois; Max Nelson, Michigan State College, and Earl Schubert, State University of Iowa.

interested in the registry should contact Mr. James N. Burrows, Registrar, American Association of Rehabilitation Therapists, 46 Beacon Street, Boston Massachusetts.

A National Science Foundation survey of scientific publications indicates that 70 per cent of all papers submitted to editors are eventually published in the journals to which they are submitted; a considerable portion of the remainder are rejected because they have been submitted to the wrong journal. Delays in publication varied from more than one year to less than six months. The average delay was 5.3 months for journals publishing 500 pages or less per year and 1.9 months for journals publishing more than 2000 pages per year. Delay in journals in which the average article ran 4 pages or less was 5.6 months compared with 2.1 months for journals in which the average article was 20 pages or more.

News and Announcements

Resignation of Dr. Wendell Johnson, for reasons of health, from his administrative duties as director of the University of Iowa Speech Clinic and chairman of the University Council on Speech Pathology and Audiology was recently announced. As professor of speech pathology and psychology, Dr. Johnson will continue the teaching, research, and writing in stuttering and semantics which he has carried on since 1931. Dr. James F. Curtis, a member of the speech faculty of the University of Iowa since 1946, was named Acting Director of the speech clinic and chairman of the Council on Speech Pathology and Audiology.

At the ninety-first Commencement exercises of Gallaudet College for the Deaf in Washington D. C. on June 1, six outstanding workers in the field of the deaf received citations and honorary degrees: Mary Elizabeth Switzer, United States Director of Vocational Rehabilitation; Linton M. Collins, Vice-Chairman of the Board of Directors of Gallaudet College; Delight Rice, daughter of deaf parents and one of the founders and first head of the school for the deaf in the Philippines; Thure A. Lindstrom, leader in activities among the deaf of the Northwestern states; Frederick Henry Hughes, famed and skilled in developing exceptional talent in the deaf; and Byron B. Burns, distinguished teacher, writer and speaker on matters pertaining to the welfare of the deaf.

Mrs. Tessie O. Shirley, of Brownwood, Texas, has been awarded the American Hearing Society's Kenfield Memorial Scholarship for 1955. The Society makes the award annually to a prospective teacher of lipreading. Funds for the Kenfield Memorial Scholarship were subscribed in 1937 in memory of the late Miss Coralie N. Kenfield, San Francisco, who was nationally known for her advanced methods in teaching lipreading.

Thumbs Up is a new picture magazine published by the Institute for the Crippled and Disabled in New York City. The new magazine dramatizes pictorially the problems of children and grown-ups whose disabilities require comprehensive rehabilitation. Copies of the publication are available without charge upon request to the Institute, located at 23rd Street at First Avenue, New York 10, N. Y.

The College of Physicians and Surgeons, Columbia University, offers a postgraduate course in cerebral palsy for physicians, therapists, and nurses. The physicians courses, three weeks full time, will be given October 10-28, 1955 and April 16-May 4, 1956. The therapists' and nurses' courses, 9 weeks full time and 8 points credit will be given October 10-December 9, 1955 and April 16-June 15, 1956. Scholarships covering tuition and maintenance are available from several sources. For information write to the Office of the Dean, College of Physicians and Surgeons, 630 West 168th St., New York 32, N. Y.

A cerebral palsy center has just been opened at the University of Virginia Hospital under the direction of Dr. Mariano Cooper. Its staff includes two physio-therapists and one occupational therapist. Future plans include adding a full time speech therapist. For the present, speech diagnosis and consultation is being done for the clinic by members of the staff of the Speech and Hearing Center of the University.

Preliminary plans have been completed to establish a special education training cen-

ter at the University of Virginia. Ultimately it will occupy a separate building and will utilize the services of the speech and Hearing Center, the Reading Clinic, the Cerebral Palsy Clinic, services in the Psychology Clinic and other special services related to this type of work.

The 1955 Tennessee State Legislature authorized a $1,000,000 bond issue for the Bill Wilkerson Hearing and Speech Center to be used in building and equipping a modern hearing and speech clinic in the medical center of Nashville. The Center, under the direction of Dr. Freeman McConnell, plans expansion of its facilities for training students in audiology, speech correction, and teaching of children with impaired hearing. Bachelors and Master's degrees in speech correction and audiology are available through this cooperative effort.

The Florida Crippled Children's Commission has been sponsoring the activities of a complete cleft palate team in the North Florida area for the past two years. This team meets at regular intervals to evaluate new cases and to follow up old ones. The team includes an oral surgeon, orthodontist, plastic surgeon, pediatrician, orthopedic surgeon, and two speech pathologists, Lester L. Hale and McKenzie Buck of the University of Florida.

Under the direction of Dr. Lester L. Hale, head of the training program in speech correction at the University of Florida, an apprenticeship program for undergraduate students in speech correction has been inaugurated. Each apprentice is assigned to a graduate clinician whom he observes regularly in clinical work. Frequent conferences are held concerning the general goals of the procedures used. Only those going into speech correction professionally participate in the apprenticeship program.

Northeastern State College of Tahlequah, Oklahoma has established a Speech and Hearing Clinic. As part of their program, a semester survey was made in 15 schools to determine the speech needs of the area. The survey covered the first six grades; 150 teachers were visited. A fund to provide clinical equipment and to help needy cases has been started by Alpha Iota Chapter of Sigma Sigma sorority.

Two classes in Aural Rehabilitation for Adults have been established by the University Hearing Center of the University of Illinois, under the direction of George H. Kurtzrock. These classes include instruction in speech reading, auditory training, and the care and use of hearing aids.

At San Diego State College approximately 70 students attend the Saturday Clinic for Children, a service giving speech training for all types of speech cases except the profoundly deaf. Parents, too, attend class once a week; for this they receive college credit if desired. In the fall of 1955, personal adjustment to the handicapped child will be emphasized. Mrs. Marcia Harris is director of the clinic and Dr. Sue Earnest is faculty advisor. Two psychiatric social workers have also been added to the staff.

Because of the lack of persons trained in public schools speech and hearing techniques, the Kentucky Division of Special Education has developed a supervisory program whereby the Supervisor of Speech and Hearing conducts a series of in-service workshops with local teachers, following a survey of that district's needs. These workshops are designed to acquaint the teachers with methods and techniques of working with the speech and hearing defective in the classroom.

To assist in the planning of programs for members interested in remedial speech and hearing at their annual meetings. the Southern Speech Association has, for several years, used a committee of three persons representing the membership of the ASHA. Requirement for membership in this committee, known as the SSA-ASHA Committee, is that the person hold advanced certification in either speech or hearing. Its membership for the past year was composed of Freeman McConnell (chairman), the Bill Wilkerson Hearing and Speech Center; Jack Bangs, Houston Speech and Hearing Center; and Ollie Backus, University of Alabamma.

The Department of Speech of West Virginia University has been authorized by the graduate School of the University to offer

a course of study leading to the Master of Science degree in Speech Correction and Audiology. The significance of this new curriculum is that it will permit the admission of students holding a baccalaureate degree who do not have the undergraduate hours in speech presently required for entrance to the Master of Arts program in speech. Detailed information may be obtained from the Department of Speech, West Virginia University, Morgantown, West Virginia.

The United Cerebral Palsy Association of Greenville, South Carolina, opened a clinic-school on April 4, 1955, to provide opportunity for children with cerebral palsy to get socio-educational experiences along with physiotherapy provided by the hospital and with speech and hearing therapy provided by the Greenville Hearing and Speech Center. This school is the only day school operating all year and it is the only one in this area.

In 1952, the Speech and Hearing Association of Greater St. Louis was organized to serve an area which includes not only the city and county of St. Louis, but 8 cities in Illinois. The membership of 75 persons includes those in public schools, university, and private practice, as well as undergraduates in associate membership. Speakers in allied disciplines are frequently invited to participate; these include orthodontists, psychologists, school nurses, classroom teachers, and principals. Dr. Wendell Johnson will be the special guest speaker this year.

A two year experimental study to determine whether the 'trainable retarded child' can be taught functional speech, will be initiated at Texas Christian University next fall. Cooperating in the project will be the Hogg Foundation of Austin, Texas, the Fort Worth Council for Retarded Children, and the Division of Speech, Hearing and Retardation Therapy, School of Fine Arts, Texas Christian University. Dr. E. L. Pross, chairman of the Speech Department, and Mrs. Dorothy Bell will direct the T.C.U. clinic and conduct the study with the active assistance of consultants from the Hogg Foundation. Results of the study will be published.

The South African Logopedic Society (Society of Speech Therapists) publishes a Journal in May and October of each year. Contributions are invited. Subscriptions are 10/-per annum including postage, Address The Editor, Journal of the South African Logopedic Society, Witwatersrand University, Milner Park, Johannesburg, South Africa.

Lawrence J. Linck, executive director of the National Society for Crippled Children and Adults, the Easter Seal Society, reports that at least 1,000 more children are being served in the ever-expanding Easter Seal Camping program this year. In 32 states Easter Seal Societies sponsor activities at 48 resident camps and 35 summer day camps for crippled children.

Meetings Announced

Sixth International Congress of Otolaryngology, May 5-10, 1957, Washington, D. C.

1955 Annual Institute on Reading, November 15-19, Benjamin Franklin Hotel, Philadelphia, Pennsylvania.

Michigan Speech Correction Association, September 17, Henry Ford Hospital, Detroit, Michigan.

83rd Annual Meeting of the American Public Health Association and 40 related organizations, November 14-18, Kansas City, Missouri.

Pennsylvania Speech Association, October 7th and 8th, Hotel Sylvania, Philadelphia, Pa.

New Materials

GO-MO Products, produces the game 'So Sorry' the purpose of which is to promote a consistent use of a satisfactory (s) sound after a child has identified and indicated an ability to produce the sound in the initial position voluntarily. 'So Sorry' has 24 colorful pictures (12 pairs) easily recognized by school-age children. The pictures are on cards of standard playing size, printed on durable cristallon plastic-coated stock.

GO-MO also produces Speech Test Record Cards and Speech Correction Hearing

Record cards. The 5" x 8" cards, are color coded in white, yellow, and green and contain information relative to diagnostic speech and hearing testing in a compact form. Additional Go-Mo material is rapidly being developed. Address Box 177, Waterloo, Iowa.

'Let's Listen!' an album of three LP training records for reading readiness and speech development by M. Marie Bresnahan and Wilbert L. Pronovost, is designed to develop an awareness of similarities and differences in the sounds of words, to provide practice in making sounds, and to establish proper patterns of child response. The records are narrated by Dr. Bresnahan. The album is available from Ginn and Company, Boston, Mass., for $7.50.

Hearing Rehabilitation, 330 East 63rd Street, New York 21, N. Y., distributes auditory training records (78 rpm) for pre-school and primary age children. The records include the following stories: The Big Drum, The Little Sticks, Little Black Sambo, Three Funny Boys, Henny Penny, Three Little Pigs, The Little Dog Whose Tail Wouldn't Wag, Three Billy Goats Gruff, Hazel Hawkins Hat, Tommy's Birthday Present, and Snow White. Each record costs $4.25.

Graduate Assistantships, Fellowships and Scholarships

Assistantship. Emerson College. Fifteen hours per week, spent in Hearing Clinic at Children's Medical Center, Boston. Half time, $1,000 for academic year, including remission of tuition. Address Adam J. Sortini, Hearing Clinic, Division of Otolaryngology, Children's Medical Center, 300 Longwood Ave., Boston, Mass.

Assistantships. Temple University. Twenty hours per week in diagnostic, therapeutic, and supervisory services in the Speech and Hearing Clinic. $1000 for ten months with the waiver of tuition fees. Nine hours of graduate credit may be earned each semester. Address Gordon F. Hostettler, Chairman, Department of Speech and Dramatic Arts, Temple University, Philadelphia 22, Pa.

Associateships and Assistantships. Hearing and Adult Speech Center, University of Denver. Starting September 1955. Half-time, $200-300 per quarter; persons to work either in Clinic or in City Institutions in speech therapy, hearing and related special education fields. Graduate load 10-15 hours per quarter, leading to M.A. or Ph.D. degrees. Address to Dr. W. J. Clark, Hearing and Adult Speech Center, Building T-8, University of Denver, Denver 10, Colorado.

Clinical Assistantships. University of Pittsburgh, Psychology Department Speech Clinic, Speech Department Remedial Speech Program, Audiology Department of Eye and Ear Hospital, Children's Hospital Cerebral Palsy Clinic. Half-time, $1,278 for the academic year of two semesters. Remission of tuition for nine graduate credits each semester and laboratory and incidental fees.

Research Assistantships. Granted to individuals on the basis of their ability to assist in the University of Pittsburgh's program of research in speech and hearing disorders. Appointments are variable as to the nature of the duties, amount of time required, salary, and permission to register for graduate courses. Assistants are required to pay tuition and fees. For further information write to Dr. Jack Matthews, Chairman, Graduate School Committee on Speech and Hearing Disorders, University of Pittsburgh, Pittsburgh 13, Pennsylvania.

Fellowship. University of Pittsburgh (in cooperation with the Department of Audiology, Eye and Ear Hospital of Pittsburgh). Clinical Fellowship in Audiology. Diagnostic and rehabilitative. 20 hours per week. $1500 for school year plus possibility of summer appointment. Fellow may carry graduate study program leading to M.S. or Ph.D. in audiology and speech correction. Address Leo G. Doerfler, Department of Audiology, Eye and Ear Hospital of Pittsburgh, Pittsburgh 13, Pennsylvania.

Junior Research Fellowships. University of Pittsburgh. Awarded to students who meet the qualifications for graduate student assistants and have demonstrated their capacity for original thought and promise of development as investigators. The Junior Research fellowships carry stipends ranging

from $750 to $1,500 with remission of laboratory and incidental fees and a tuition allowance of nine credits per semester for appointees not eligible to other scholarship provisions. The stipend is regarded as an award to the promising graduate student rather than as remuneration for services rendered. Junior research fellows are expected to pursue graduate studies and research on a full-time basis. Write to Dr. Jack Matthews, Chairman, Graduate School Committee on Speech and Hearing Disorders, University of Pittsburgh, Pittsburgh 13, Pennsylvania.

Fellowships. University of Wichita (employment in the Institute of Logopedics). Duties primarily clinical. $200 to $250 per month; student expected to pursue course work toward the M.A. degree. Address Martin F. Palmer, Sc.D., Institute of Logopedics, 2400 Jardine Drive, Wichita 14, Kansas.

Necrology

Irving J. Lee, Professor of Speech, Northwestern University, Evanston, Illinois, died Monday, May 23, 1955. Dr. Lee was on the Northwestern University faculty since 1938. One of the foremost leaders in his field, Dr. Lee will be remembered for his important contributions in the area of general semantics as author, lecturer, and teacher.

Dean Waldo E. Lessenger, under whose leadership the College of Education at Wayne University gained first-rank academic standing, died in Detroit on May 14, 1955. A well known figure in teacher education, Waldo Emerson Lessenger will be long remembered by American educators.

Special Announcement

The Navy Electronics Laboratory is sponsoring a Symposium on Speech Communication Research to be held at the Laboratory in San Diego on November 15 and 16, 1955. These are the two days just preceding the meetings of the American Speech and Hearing Association in Los Angeles.

The purpose of the Symposium is to report recent research results, review the present state of progress in the field, discuss new ideas for research and development and note possible military applications. It is the intent to accomplish these aims by having papers on hitherto unreported work or new work to be undertaken, by having critical reviews of longer term projects, and by panel discussion sessions.

Anyone interested in attending or anyone interested in participating should submit their name and/or a short abstract to John C. Webster, Code 2124, U. S. Navy Electronics Laboratory by September 30. Any other suggestions for the symposium agenda will be welcome.

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